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# CoEVOLUTION Quarterly

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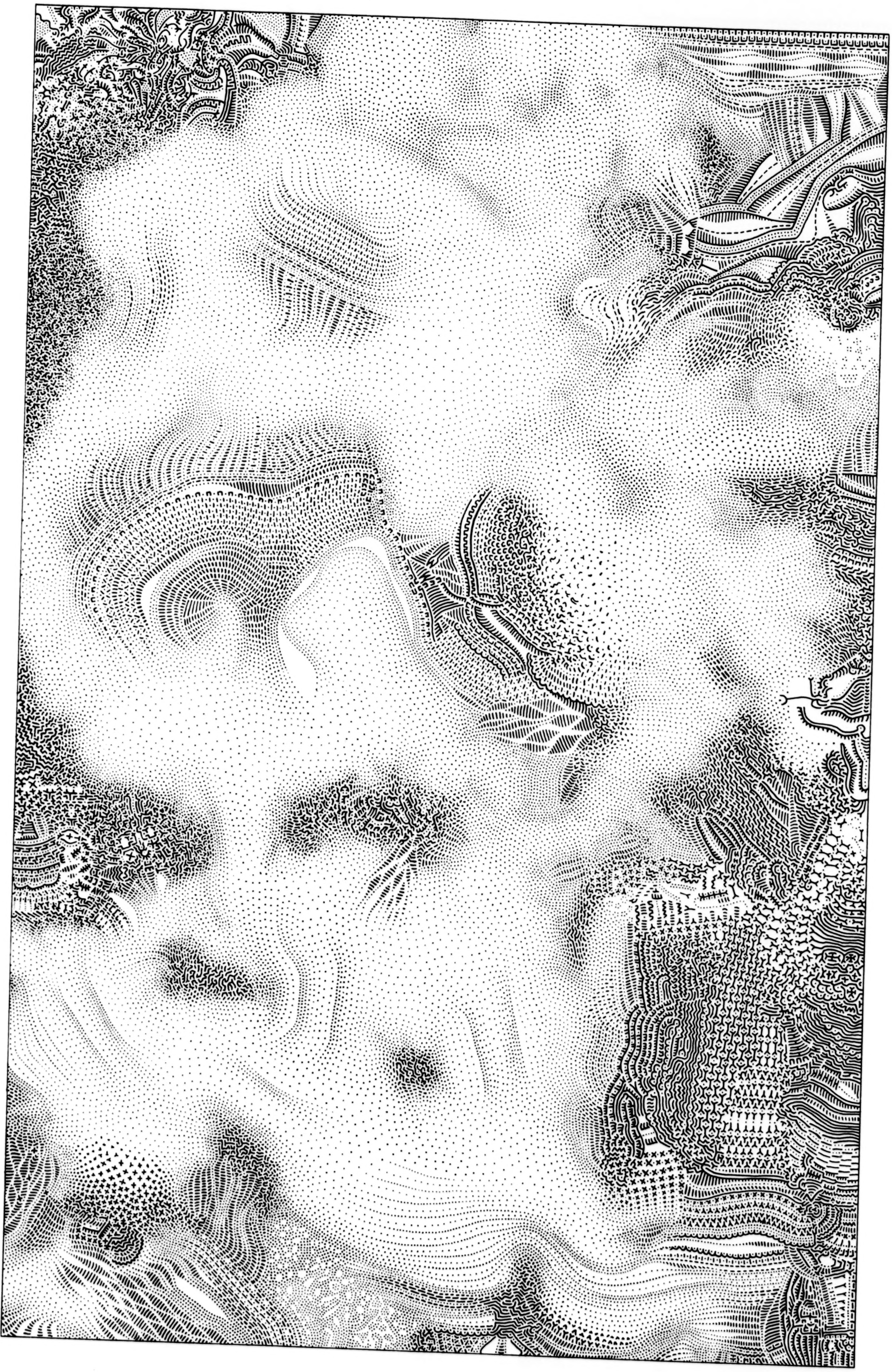
Robert Frank

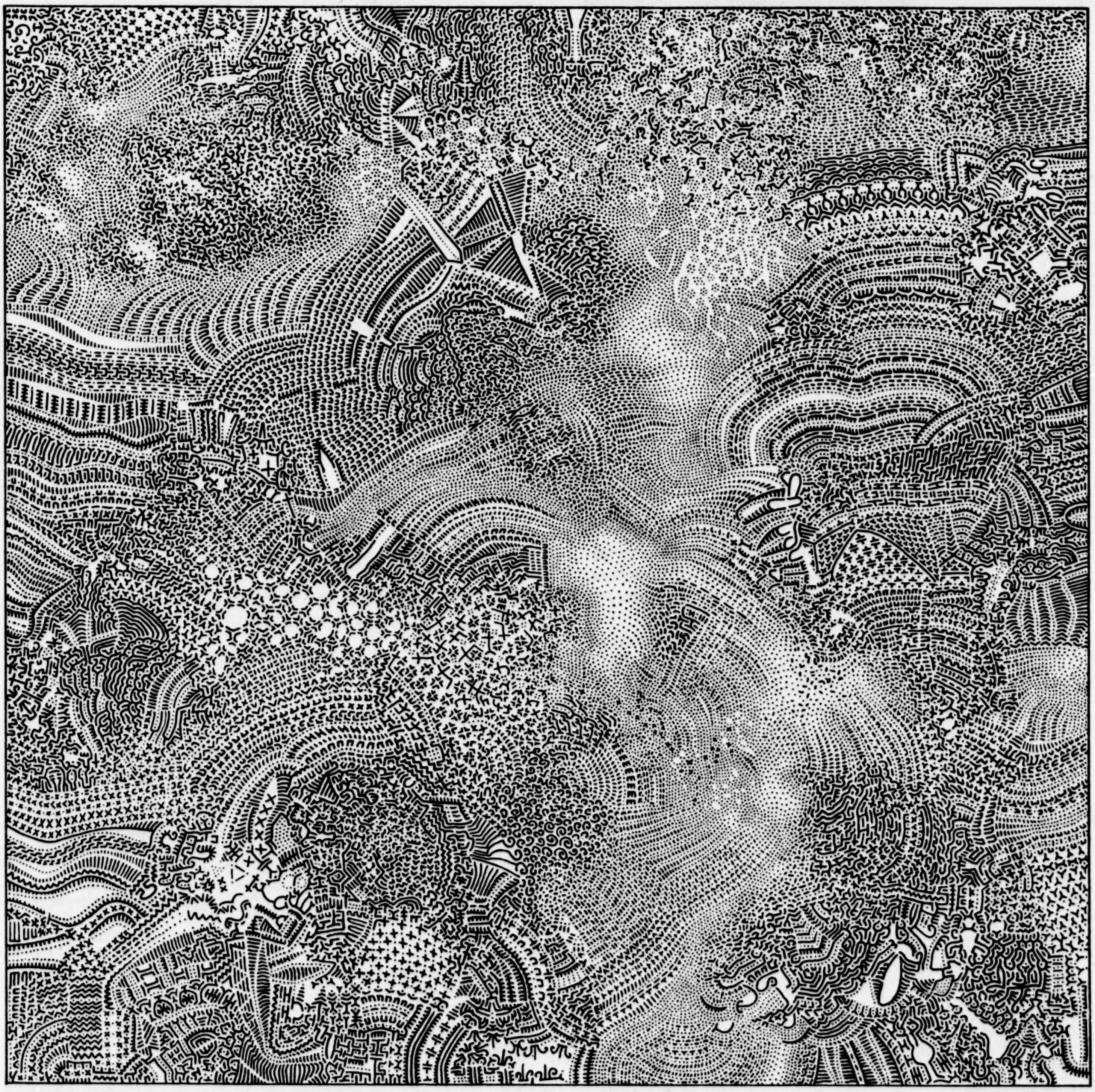
## Robert Frank returns to still photography



**THE SQUARE DRAWING below is titled *All at Once* and was done September 9 - 15, 1980; the one on the facing page is called *Same Old Everything (Always Different)* and was done August 6 - 12, 1980. Both are improvisation (no preliminary plans or sketches), ink on paper, reproduced here actual size. *Same Old Everything* is loosely based on the metaphor of the Earth seen from low orbit, with patches of incompletely revealed but rich and diverse local orders dissolving into/emerging out of deserts/clouds (the figure-ground ambiguity overrides the metaphor because in fact the ink is figure and the paper is ground). *All at Once* is based on the notion of "temporal illusion": when the drawing is complete, what is seen is a long sequence of opportunistic growth congealed into an apparent simultaneity. History foreshortened into structure, process into place.**

# Two Drawings

*by Robert Horvitz*



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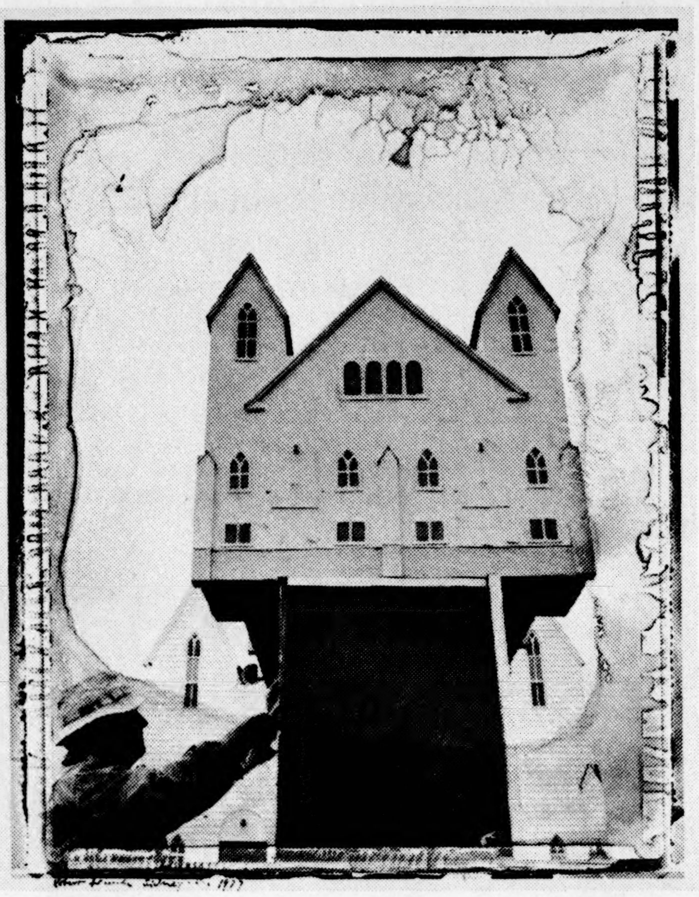

## COVERS

*"Robert Frank, Swiss, unobtrusive, nice, with that little camera that he raises and snaps with one hand he sucked a sad poem right out of America onto film, taking rank among the tragic poets of the world." So wrote Jack Kerouac, 1959, in his introduction to* **The Americans**, *83 black-and-white prints by Frank that changed the direction of creative photography. (The book is still in print from Aperture, Millerton, NY. Prints from the book cost $4000 these days — not that Frank gets it.)*

*By the early sixties he was one of the most highly regarded photographers around (that reputation has increased rather than diminished since), but Robert Frank wasn't taking photographs any more. "Once the shutter clicked I would shut my eyes or turn away. It was dead." Instead he was shooting film, from* **Pull My Daisy** *in 1960 with Kerouac, Allan Ginsberg, Gregory Corso, etc., to* **Life Dances On** *in 1980 with his son Pablo (who also is in the front cover photo). Typical story: in 1971 the Rolling Stones responded to Frank's growing underground cinema renown by hiring him to film their epic tour of the United States; he did; the resulting* **Cocksucker Blues** *(1972) was too brutally honest for the Stones, so it can't be distributed and may only be seen at noncommercial showings.*

*That's why it's a big deal that Robert Frank is starting to work with still photography again. His medium at present is 3¼" x 4¼" Polaroid positive-negative film, the processing conducted with "selective carelessness." Each print has only what is in the original negative. The one here is from Sydney, Nova Scotia, Sunday. The back cover image was made on St. Patrick's Day, 5th Ave. and 59th Street, New York. Robert comments, "Monuments are passionate statements of hope — heroes and heaven. Life is more."*

*Meanwhile he keeps filming. The newest one is underway on p. 46.* *—Stewart Brand (SB)*

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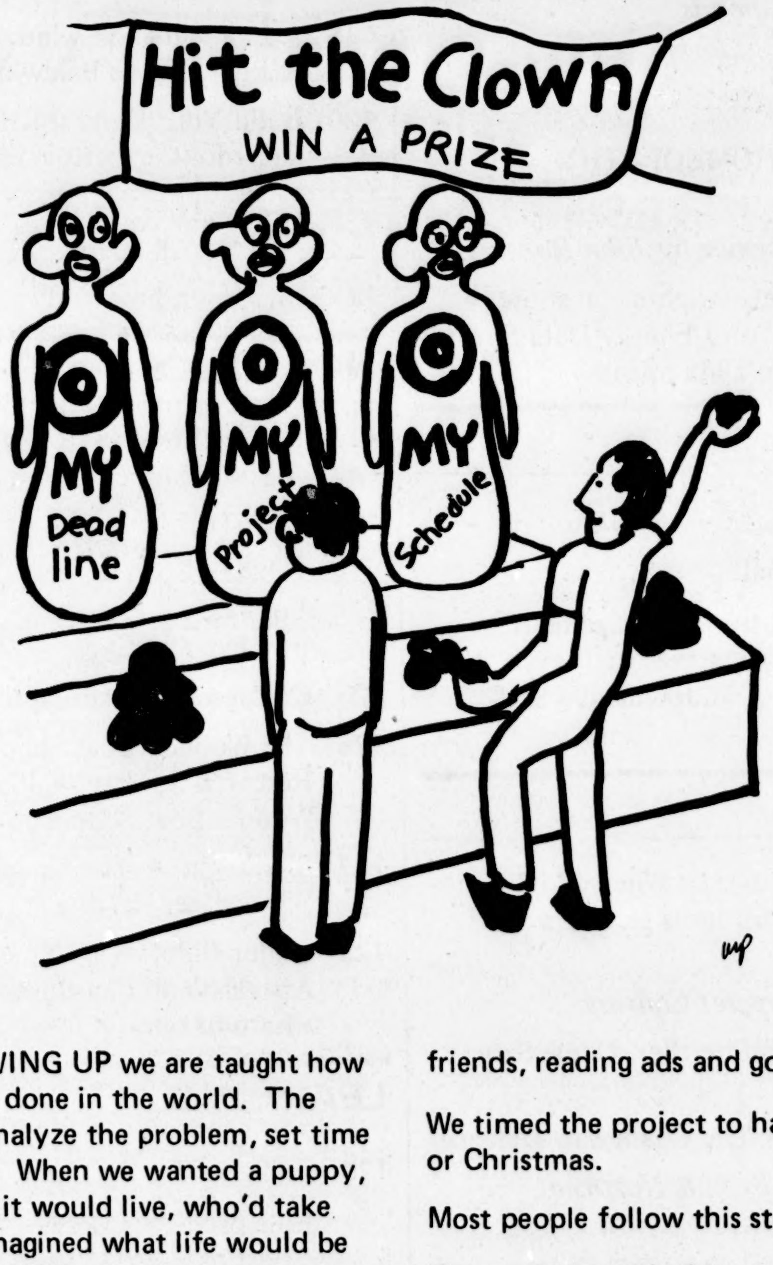
# ON CHANGING INSTITUTIONS

*by Michael Phillips*

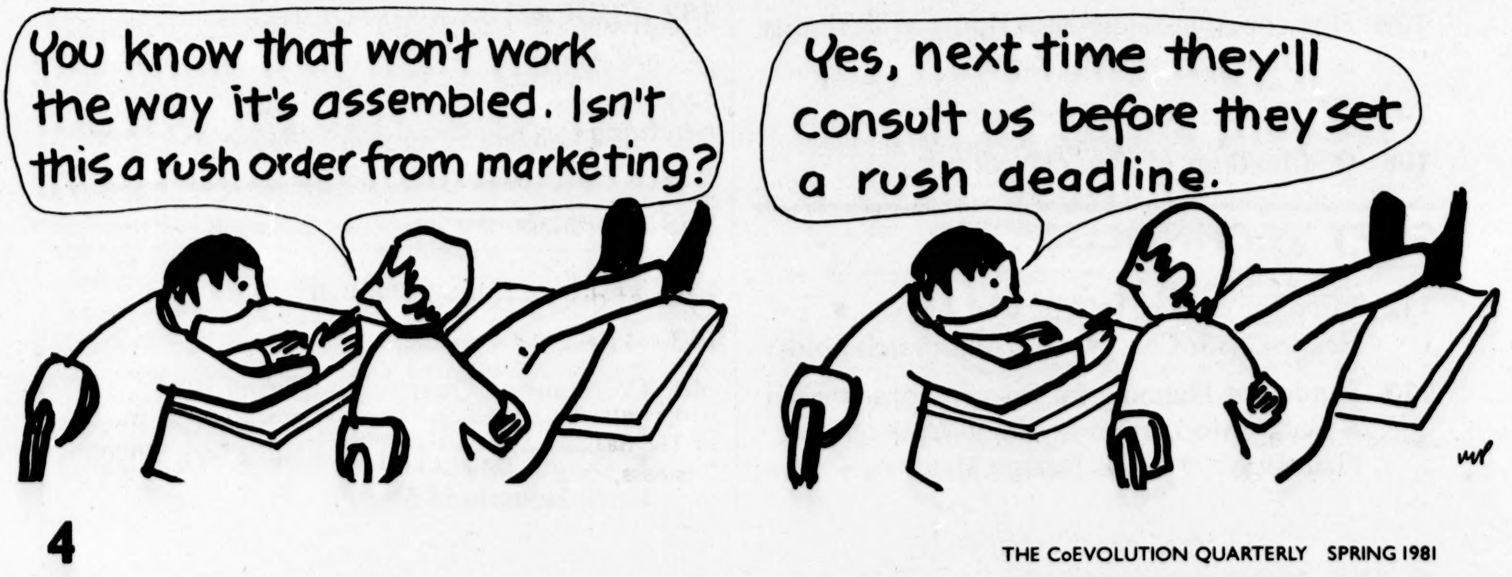

Hit the Clown
WIN A PRIZE
MY Dead line
MY Project
MY Schedule
mp

**WHILE GROWING UP** we are taught how to get things done in the world. The process is: analyze the problem, set time limits, and then do it. When we wanted a puppy, we figured out where it would live, who'd take care of it, and then imagined what life would be like with the dog as our friend. We thought of ways to convince our parents about our good idea and planned the steps to get the puppy: asking friends, reading ads and going to visit the pound.

We timed the project to happen on our birthday or Christmas.

Most people follow this strategy all their lives.

The problem with this approach is that it doesn't work. It especially doesn't work for getting things done in institutions.


You know that won't work the way it's assembled. Isn't this a rush order from marketing?
Yes, next time they'll consult us before they set a rush deadline.
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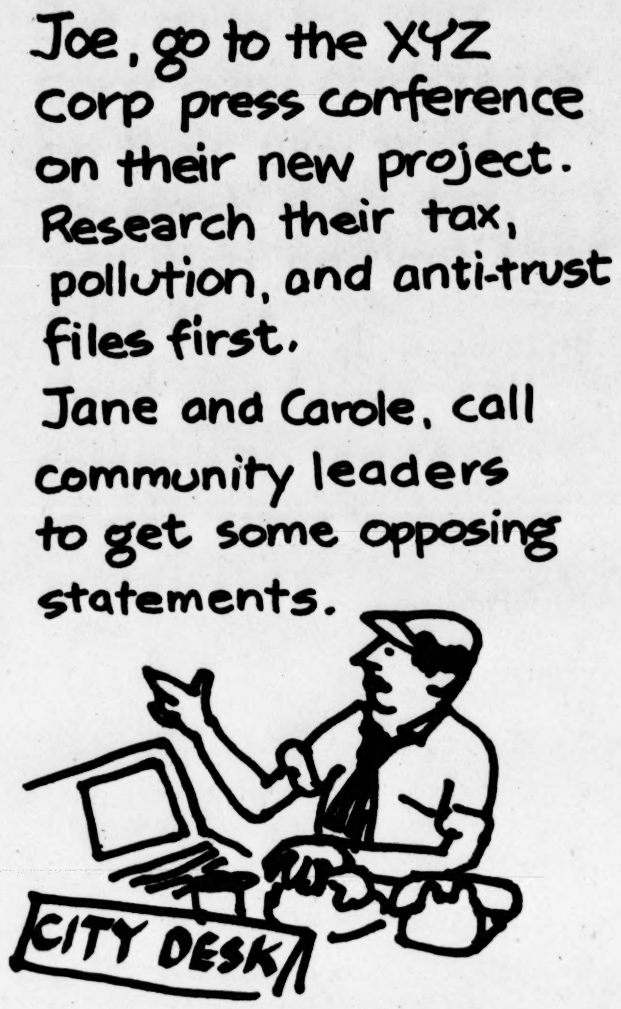

Joe, go to the XYZ corp press conference on their new project. Research their tax, pollution, and anti-trust files first.
Jane and Carole, call community leaders to get some opposing statements.
CITY DESK

The following table suggests why it doesn't work. The interests of individuals do not coincide with the interests of institutions.

| | Individual Needs | Institution Needs |
|---|---|---|
| **Recognition:** | Appreciate "me" for the good "I'm" doing | To reward all people for their cooperative efforts |
| **Planning:** | To have clear goals and precise tactics | To have goals that include diverse departmental needs an and allow widespread support |
| **Action:** | To move step-by-step, to have tight quality control, and to maintain constant monitoring | Allow time for all diverse needs to be expressed and incorporated in the process |
| **Timing:** | To set time limits which allow the measurement of progress | To avoid precise limits. Instead set a pace of "steady, consistent progress" |

### INDIVIDUAL APPROACH

Let's follow a change process using both approaches.

Tom Smith arrives in Santa Rosa and holds a press conference at his hotel announcing that his company, Smith Development, plans to build a major 15,000 square foot airport on the east side of the city in 18 months. He hires a local planning firm. When they finish their work, he calls another press conference. After that he starts buying land and hires the architects for the final design. A few months later he shows the final airport model to the press with an announced completion date of 14 months in the future. Then he begins the process of getting permits.

Of course the airport will never be built. Public opposition will stop Smith regardless of how much money he puts into the project. Smith followed the approach that satisfies individual needs but not institutional needs.

### INSTITUTIONAL APPROACH

Here is the successful approach of Sam Redford. Sam moves to Santa Rosa for a long stay. He talks to everyone he meets to get the names of anyone who would be interested in a meeting to discuss Santa Rosa's need for a new airport. At the meeting his role is to encourage the natural leaders and interested parties to form a study group, and he offers his time to help them. As the process grows, Redford gets this first group's approval to use their names in talking to all community groups in Santa Rosa while the discussion is at its rudimentary, formative stage. No time line is ever discussed. All groups are encouraged to express opinions and are privately sought out to make sure their opinions are heard and understood. From this point on, Redford helps diverse groups find areas of agreement and encourages slow, careful planning studies which encompass the expressed needs of the broadest consensus. The final planning report is taken to every possible interest group for evaluation, especially government agencies, before actual designs are begun. Everyone is included, from Boy Scouts to union leaders.

The whole process may take four years. The final airport may have severe restrictions on noise, pollution, and parking, and it may only be open from 8 a.m. to 6 p.m., but it will be built if it's in the interest of the people of Santa Rosa. Sam will probably be the developer, but he won't get much recognition if he's gone through this process effectively. Everyone else (especially politicians) will get credit.

Anything else Sam sets out to do in Santa Rosa from then on will get widespread support.

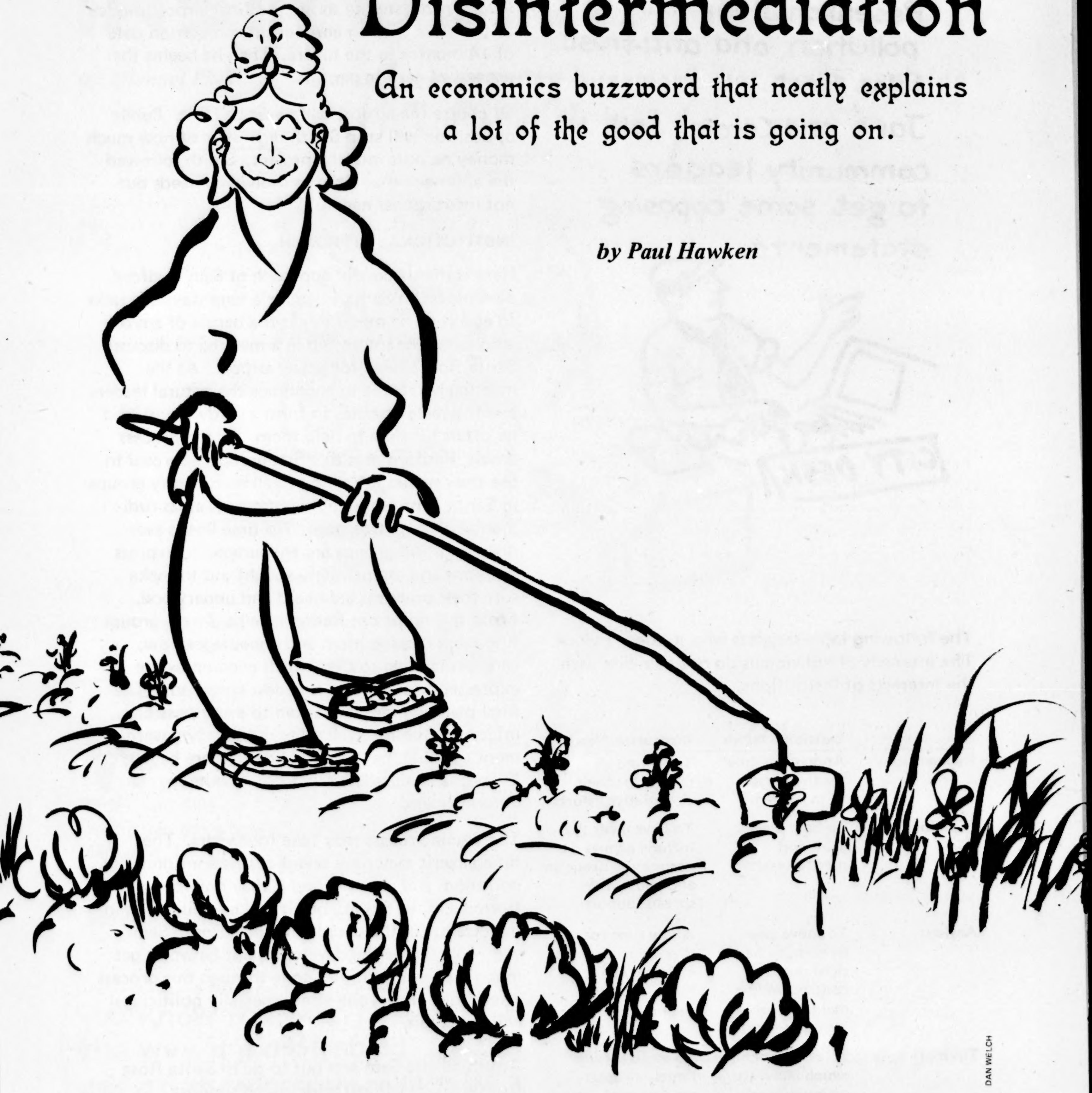
The differences between Tom and Sam are the same ones point by point, that are shown in the table of differences between individual and instutional needs. ■

*San Francisco change agent Michael Phillips is the author of* **The Seven Laws of Money** *and (brand new)* **Honest Business**, *reviewed on p. 93.* *—SB*

# Disintermediation

## An economics buzzword that neatly explains a lot of the good that is going on.

*by Paul Hawken*



DAN WELCH

*Amateur economist Hawken's article in last Summer's CQ – it was called "What's Economical?" – hadn't been in print for two weeks before he got simultaneous phone calls from Bantam Books in New York and the Senate Finance Committee in D.C. Bantam wanted him to write a book based on the article ("Name your price"). The Senate Finance Committee craved his advice. Meanwhile, you – the CQ readership – sent us numerous nods of approval and interest, so Hawken has been signed on as a regular contributor to report, critique, and speculate on "the central organizing principle of this decade" – economics.*

*Illustrator Dan Welch is a senior monk at the same Zen Buddhist monastery where Hawken hangs his hat.*
*–SB*

In economics, disintermediation is used to describe the displacement of funds from banks and savings institutions when depositors decide to seek higher yields by investing on their own, by-passing the institutions.

RECENTLY I HAVE BEEN USING the word "disintermediation" to analyze economic and social activities which seem vibrant, growing, and healthy. Conversely, "intermediative" describes corporations, businesses, and professions that seem stagnant.

In economics, disintermediation is used to describe the displacement of funds from banks and savings institutions when depositors decide to seek higher yields by investing on their own, bypassing the institutions. In order to replace those funds, the bank has to go out into the market and "buy" those deposits back at substantially higher rates of interest than they were paying depositors. During the last credit crunch many of the institutions found themselves paying more interest than they were receiving in interest from their loan portfolios. They were being disintermediated.

Disintermediation can describe a far broader spectrum of economic activities than merely the outflow of funds from banks. For me, the word has taken on a sudden magic far removed from its corrosive implication to savings institutions. In order to understand those implications it is necessary to see how thoroughly imbued and accepting we have become of the fact of intermediation in our economic lives.

Up until the time that energy became expensive, the world economy was expanding. Like a universe, the expansion was in all directions simultaneously, which meant that the distance between components lengthened, requiring intermediative goods and services. Not only did the industrial sectors require intermediation, but so did our lives Take the farmer. From a self-sufficient economic unit in which most or all food was grown for animals and family, where energy was provided in situ through animals, and where even tools were at least repaired if not made, the farm became a component in a larger web of intermediative activities. Now a farmer's food for the family is bought at stores where it is trucked in on roads requiring service stations and motels for truckers who are hired by companies who buy their rigs in Detroit, leasing them from banks who refinance their assets by purchasing paper on the open market at a discount to their lease in hopes of making a profit. The banks require computers for monitoring their complex activities and large centers of high rises in cities to which their educated personnel commute by car or public transportation. To produce crops the farmer buys hybrid seed, possibly grown in Costa Rica the previous winter, uses leased or purchased equipment requiring the same financial intermediation as the truck, buys fertilizers produced by Occidental Petroleum from natural gas obtained in Libya whose leaders tell the President's brother that they might cut the gas off if they can't get airplanes in order to maintain order at home and abroad, etc., etc. The list gets boring.

Vocationally, intermediation is synonymous with specialization. The rapid expansion of the economy required that we narrow our focus into narrow niches and become consumers of each other's specialities. Tax lawyers and psychiatrists have a lot to talk about to each other it seems, and the farmer is so busy "farming" he doesn't have time to grow his family food.

It is important to understand that the impetus towards expansion was not a cultural, religious, or political act. It was primarily economic, and it will not stop until economic expansion stops. My contention is that the expansion is stopping, or has possibly stopped, and that intermediation as an economic act has a short life. It will not work nearly as well as it did during the growth of the mass economy, and what has already begun to work very well is the opposite approach, disintermediation.

Disintermediation cuts across those intermediative factors. Growing your own food for example. Disintermediation reduces both costs and energy, making the farmer or homeowner more sufficient, independent, and economic all at once. When energy was cheap and the economy was growing, it was truly cheaper to buy food than to grow it. But as many have predicted, the long lag between the huge increases in the price of oil and the subsequent increase in food prices is catching up with us. As food continues to rise in price, more and more people begin the disintermediative process of gardening. It is an economic act that clearly recognizes the geopolitical reality and acts upon it.

*more* →

As food continues to rise in price, more and more people begin the disintermediative process of gardening.

Even the stock market recognizes the value of disintermediative businesses. The two investment high flyers this winter were disintermediative businesses: Apple and Genentech. Apple is part of the computer industry which has until recently largely served big institutions. Apple was one of the first companies to recognize that rapid access to and processing of data could help small businesses and individuals disintermediate services they formerly bought. Genentech's genetic engineering technology promises to eliminate the middleman of animals and plants in the case of some drugs, and fossil fuels and factories for some chemicals.

Disintermediative livelihoods are described by Jay Ogilvy in **Many Dimensional Man** (see **NWEC**, p. 388) as paraprofessionals, those whose jobs and skills cut across the narrowness and specialization of a legal, medical, or other profession. Midwives have disintermediated the power Ob-Gyns have had over women and birth. Paralegal professionals are giving disenfranchised groups access to the rights formerly held by the wealthy. **The Whole Earth Catalog** spawned hundreds of publications that disintermediated the knowledge and information held by institutions and associations, and it indirectly helped disintermediate the grip New York had on the publishing business by stimulating small presses.

Health disintermediates doctors, frugality disintermediates shoddiness, and so on. The list is endless. This is not to say that disintermediation is always good per se. Crime is disintermediative. I rob the bank and I have disintermediated a job.

Just as intermediation is natural to an expanding economy, disintermediation is the natural and appropriate activity in a steady or contracting one. Intermediation is to the mass economy what disintermediation is to the informative economy. [See Hawken's essay "What's Economical" in the Summer 1980 **CoEvolution**.]

Although intermediation caused enormous fragmentation of our society, fragmentation is another way of saying differentiation. Intermediation created a milieu in which disintermediative forces can newly combine differentiated components into a new economic order. The rapid proliferation of economic subspecies will inevitably result in new forms that never could have occurred without the prior disintegrative effects of intermediation and expansion. Disintermediation will lead to an explosion of these newly combined forms, a hybridization of culture, hardier and more adaptive social forms, and most importantly, a broad array of new social intelligence. It is profoundly evolutionary in its potential, but of course it is rather chaotic.

If you cut open a cocoon at a certain stage in its transition from caterpillar to butterfly, it is a mess inside. There is no discernible organizing principle in the gooey little mass of molecules, and it wasn't until Prigogine's work* that we had a theory that allowed for intelligence to be distributive and collective rather than centralized. Similarly, the economy in this transition from intermediative to disintermediative has no plan. The nonmanifesto is broadly distributed and widely acted upon because its "intelligence" does not come from concept but from some deeper organizing principle acting within and upon the the economy.

The two dominant economic agendas abroad in the land don't allow for the possibility of economic breakdown being a natural evolutionary step. One of them is the bullish view, a let's-get-the-show-on-the-road Rotarianism that infests most of the business world. What it is saying is that we are slipping as caterpillars, and we better get back into shape and be caterpillars. The second view is the survivalist school of economics, the proponents of which are mostly nodding disciples of Frederick von Hayek, the Austrian economist. This view says that the caterpillar is dead and you'd better step lively to avoid the mess. The first school represents greed, the second fear. The first says "go get it"; the second says "it's getting us."

Meanwhile, disintermediative activities grow. The first appearances were in the sixties when most of the activities were pooh-poohed as a kind of back to the land romanticism. It was indeed romantic because the first impulses towards disintermedia-

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*Ilya Prigogine, **From Being to Becoming: Time and Complexity in the Physical Sciences**, 1980, W.H. Freeman, San Francisco.

**Just as intermediation is natural to an expanding economy, disintermediation is the natural and appropriate activity in a steady or contracting one.**

tion were aesthetically motivated. They were statements that needed to be made, usually articulated by post-war youth who had been thoroughly steeped in an intermediative culture in which the pieces were being chopped finer and finer. These early statements were often made with a flair for showmanship that deceived viewers into believing it was just a show. Between the sixties and now the economy has changed more rapidly than anyone ever could have predicted, and now disintermediative activities are undertaken because they work.

Liberals would argue that the complex and intermediative quality of society is the result of a political consensus long ago agreed and acted upon, deriving much of its impetus from the dislocating experience of the Great Depression. Certainly Galbraith would make this argument and, although it is not currently in favor, it is true. We did make those decisions (and we may have just rescinded them, too). My concern is that neither the liberal argument for an intermediative government being arbiter of resources, or the conservative argument of Reagan's that the marketplace (read business) should do the same, takes into consideration the fundamental structural changes going on in the economy. We are not seeing a shift in power, although we can attempt one, but a dissolution of power away from the polity and the corporation into what only could be called the ebb and flow of information within the culture, a frustratingly diffuse locus.

By definition then, the "informative" economy is an extremely difficult economy to put your fingers on. It has no business page. No magazines. No indices. It is difficult to measure in economic terms a homebirth, a person living on a boat, frugality, barter, or durability. Interestingly, if there is any measure, it is probably in its absence from normal measures of the economy. Attempts to measure that absence or the "underground economy" have been notably unsuccessful. The government recently estimated it at 10%. More recently economist Edgar Feige of the University of Wisconsin has derived a far larger assessment of its size – 30% of the Gross National Product (GNP); an economy of 700 billion dollars, larger than the GNP of France. When you remove from that crime and the checkless cash economy, there is still a lot left. According to Feige, prices are lower in the underground economy, employment is high, and growth is healthy. And just as interesting is that the overall underground economy is an attempt to disintermediate government; it pays little or no taxes.

Against the ebb of intermediative economic activities, the Reagan administration is attempting to implement a broad economic program. The President's supply-side policies are intended to brake inflationary expectations and eventually reality by shifting spending from consumption to production. There will be: some kind of tax cut, perhaps as big as 10% per year for three years for individuals and some cuts for corporations as well; a reduction in overall government spending for defense; a stricter control of the monetary policies of the Federal Reserve Board with an emphasis not so much on higher interest rates (as a means to control credit demand) but on real control of monetary supplies; and reduction of regulatory policies which have restricted economic growth and investment during the past decade. The purpose of this is to shift the non-productive spending of the federal government back to productive individuals and businesses. It is hoped that individuals, having had their inflationary expectations reduced by a credible effort towards reducing inflation will save their money, making more funds available for lending to business and housing, stimulating production, capital investment, higher productivity, and therefore lower inflation. Underlying all of this is a broad and important assumption: that the 1980s will see large increases in capital investment in new factories, machines, and technologies.

That is too much to put in one paragraph. But it gets to an underlying assumption of the administration, which is that there is a normative economics to return to, that we can restore overall growth, prosperity, and productivity without increasing inflation or enduring a sharp or deep recession. The overwhelming problem with that argument as it stands is that it assumes our problems are endemic only to fiscal policies of the government. The government did something wrong, leadership was out of whack, now we will change that and get us moving again. Unquestionably, it was the only politically tenable approach to oust Carter and get elected, but its political tenability will have little effect on its outcome.

The United States economy stands at a threshold, as I stated in the Summer CQ article, between the

**It is difficult to measure in economic terms a homebirth, a person living on a boat, frugality, barter, or durability. Interestingly, if there is any measure, it is probably in its absence from normal measures of the economy.**

recent peak of the "mass" economy and the onset of what I call an "informative" economy. The mass economy is primarily an extractive and manufacturing economy that has grown to huge proportions worldwide, leading to millions of ancillary services. It has resulted in massive production of goods, massive consumption, a good deal of waste and pollution, oceans of currency flowing between nations and institutions, and an enormous amount of perceived wealth in the hands of individuals and companies. That the bulk of Reagan's top officials and advisors come from this world means that their policies will be congruent with their expectations. The mass economy was a good world for them, and the events of the past decade which have seriously undercut the power and liquidity of individuals and corporations pose a serious threat to their mass economy.

The question I put is whether inflation, lack of growth, the beginning signs of stagnation, and lowered productivity are signs of a sick economy or whether they are not, instead, signs of a major shift and restructuring of the world economy. If the former, Reagan is on the right track generally. But if otherwise, Reaganomics will suppress the symptoms, delay positive and transformative changes within the economy, and precipitate the credit collapse I predicted in the last article.

The problem is growth. Any policy or economic theory which tries to produce more growth, whether demand-side or supply-side, will exacerbate an already unstable world economy. Any organism which has exceeded its available supply of nutrients will grow in unhealthy ways. Plants which are forced with nitrogenous fertilizers quickly show potash and phosphorus deficiencies unless those chemicals are also added. A world which has relentlessly and even recklessly expanded its production of goods and materials for several hundred years has run into limits, and fiscal tinkering is neither the cause of those limits nor their cure.

Because resources, particularly energy, are reaching their known limits of extraction and distribution rates, we face a non-growing and, even now, a slightly contracting economy. To promote real growth means we must try to increase the amounts of goods and services produced by an individual. In order to do this we need to invest capital in machines and technology (computers, robotics, automation) which will allow that to happen. That requires intensive use of resources, not only in terms of oil and minerals, but in terms of the new factories and plants that must be built in order to create this new generation of capital-intensive boosters to productivity. That means more sunbelt cities, new housing, more cars, shopping centers, TVs, etc. To accomplish all this means a heavy rate of re-investment by institutions and individuals, and a high rate of corporate borrowing as well.

If the result of supply-side policies is indeed higher productivity, it could mean lowered inflation and a stabilized economy. But I don't think it will. When labor was cheap in this country, productivity was low relative to today. As technology and mechanization increased productivity, wages rose and so did real demand for goods, placing further demands on production. This pattern of production, consumption, and technological innovation has continued unabated for over a century. The process was greatly aided by resource prices that steadily fell in real terms until 1973, when they reversed a century-long pattern. At a certain point in a mass economy, growth is no longer sustainable because the need for resources and energy to fuel further productivity has outstripped the carrying capacity of the Earth and one's immediate environment. When this happens, the relationship between wages, output, and resources changes once again, almost to the converse. Wages become lower in relationship to capital and resources. Although this does mean lowered productivity in conventional terms, innovation then becomes even more important, also with a change. All past technological innovations can be traced back to their ability to transfer output from people to oil. As oil is withdrawn due to high price or perhaps uneven distribution later on in this decade, innovation will start to shift away from purely labor-saving ends. The paradox of world development is that it has produced an enormous population explosion which prospered as long as human calories could be replaced by extractive calories.

Now that the reverse is beginning to happen – i.e., it is less expensive to hire a person in some cases than a machine – the type of innovation required is not the innovation of more sophisticated machinery, or even data processing, it is human innovation, the transformation of the relationship between homo sapiens, mass, and the environment.

**According to Feige, prices are lower in the underground economy, employment is high, and growth is healthy. And just as interesting is that the overall underground economy is an attempt to disintermediate government; it pays little or no taxes.**

This transformation and its attendant economic pathways are what I broadly refer to as an informative economy. If we simply reinstitute old formulas for raising productivity, we will make it worse for ourselves. In the last year alone the price of oil has risen almost 50%. The cost of capital is between 16% and 22%, and wages have risen slightly more than 12%. That is the new relationship between resources, capital, and people. What that tells us is not to invest more expensive capital in order to increase extractive resources in order to make more machines in order to make more goods so that more people can become part of the "service" economy and receive a cornucopia of goods. If we try, we will find ourselves impoverished instead. For as the demand increases for resources, capital, and therefore goods, the economy bifurcates in a skewed manner, tipping the balance of wealth decidedly away from the middle and lower classes towards a small body of individuals who control larger and larger economic institutions. And that is a dumb way to distribute capital.

The reason that the middle class has not realized its impoverishment is because it has partial ownership of houses which have soared in value. In a sense the high price of real estate was a consumer end run around inflation, a revival meeting that has everyone convinced that real estate beat the inflation game and will continue to do so. While not wanting to argue the fine points of this perception, there are some things to be pointed out here. In most areas of the country you can no longer get loans on real estate, which means the owner has to carry back his mortgage and then some if he wants to get out the equity. The only equity that can be extracted then is a promise to pay by someone else, in other words a note. Recently I asked a speculator who made money in the stock and commodities markets what he would do if he were in the markets today. "Sell real estate short, if I could," was his instant reply. Talking about a real estate "crash" is like explaining flying to a caterpillar, because the last time it happened in this country was 1929-32.

Notice that if you take away homeowner's equity, most people are far poorer today than ten years ago.

As the relationships between resources, capital, and labor shift, mass economists would like to reverse the process by a surge of capital investment into production. The informative economy is dealing with it by innovating new relationships between people and mass. The mass economists suggest that we don't have to change but the world does. The informative view says that we have to change because the world is ineluctably on a course which will not change for many decades – increasing population, decreasing resource availability.

This is why the world appears to be contradictory. It seems to be going in two directions at once – and it is. One is towards concentration of resources, capital, and secular power. The other is towards disintermediation, adaptivity, and decentralization. Both are adjustments to the same phenomenon. The first is an adjustment to the poor rate of return experienced by corporations on their investments in existing plants, equipment, and research. The second responds to the poor rate of return individuals are receiving from their life's work and toil. Therefore, both individuals (some) and corporations (most) are changing their strategy. Corporations have been buying up undervalued companies by parlaying their equity into increased holdings, thereby concentrating economic power. Individuals are disintermediating those same institutions. I think it is the individuals who will gain the upper hand.*

*more* →

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*It is interesting to note that disintermediation is continuing apace in the financial industry and threatens to change entirely the manner in which corporations operate. Because individuals are no longer willing to sell their cash at wholesale rates (5¼%) while banks rake in retail loan returns, higher interests are being paid by all fiscal institutions. Inflation and changing consumer attitudes mean that it has become very difficult for corporations to borrow long, meaning 15 or 20 year bonds. People don't want to buy them at low yields, and corporations don't want to be locked into the higher yields that are required in order to sell them. What this has meant is increased short-term borrowings by all institutions, borrowings at higher rates of interest which limit what the corporation can and cannot do with capital. Higher interest rates not only dampen corporate enthusiasm for long term projects (who wants to build a steel mill if it loses money when it is finished?), but they mean that fewer projects are economic in real terms. Much of what formerly would have been the rate of return is paid out in interest. In other words, consumer demand for higher interest rates is beginning to disintermediate the corporate ability to make widgets. Rather than invest in long term notes from A.T. & T., people and pension funds are buying index funds. Institutions are fighting back with variable rate mortgages. We homeowners have countered by holding our own paper and mortgages and leaving the S & Ls out altogether. Their move.

> What then would be appropriate economic activity for the prudent individual in the eighties? In terms of livelihood, the pursuit of any career, enterprise, service, or education which will disintermediate established modes of business.

If Reagan attempts to buttress the mass and intermediative economy, which seems inevitable given his view of the world, we can expect a rough scenario of the Reagan presidency to run as follows. He is inheriting a massive budget deficit and will be able to cut little from government spending. Tax cuts will be passed, but only in a compromised version. As the psychology of growth mushrooms (it already is), the demand for money will soar, and interest rates will remain well above the 10% core rate of inflation – probably between 16% and 24%. As Peter Drucker has pointed out, the cost of money is the real rate of inflation. Therefore, the high demand for money and the need for tight control over money supply will create de facto inflation. The important goal, to break the psychological grip of inflation, will probably be lost. Deficits could grow. Consumers may react to that by spending their tax cuts on more real estate and goods, rather than saving. A surge in stock market value may also attract a lot of speculative participation, but that in itself will not directly raise capital for corporations. New stock issues will, but it is likely that investor attention will focus on those companies which have good cash reserves and liquidity rather than underfinanced ones.

During this time, the major oil producing nations will be pumping less oil. There is nothing the U.S. can do in the next 8 to 10 years to greatly increase domestic production of energy irrespective of what Reagan does. So we will be increasingly vulnerable to energy disruption, which translates into susceptibility to large cost increases. As the price for oil rises, the need of producing nations for extra amounts of continuously debasing currency will fall, and they may cut production further, placing more demand on prices – a backward sloping supply curve.

Such a condition, easily attained during the '80s if there is no serious attention to conservation, would create hyperinflation in the United States and lead to a credit collapse sometime in the '80s. There is nothing yet in the Reagan program to dissuade me from the predictions made in my previous article. We can look for a rapid rise in the stock market, a do-no-wrong bullishness, a

FOR SALE
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last-of-the-wine kind of feeling in the economy during the next few years in which we all will seem to be getting richer. If that occurs, then the policies of the Reagan administration will have pushed the mass economy into an earlier demise than it would normally take, and it will in turn greatly accelerate the movement towards an informative economy.

What then would be appropriate economic activity for the prudent individual in the '80s? In terms of livelihood, the pursuit of any career, enterprise, service, or education which will disintermediate established modes of business will be well worthwhile. This does not negate conventional professions, but it does look at them in a new light. A doctor who remains tight-lipped and only dispenses drugs is not giving the patient quality information. A doctor who can break that cycle and educate patients towards preventative medicine and away from palliative is disintermediating.

- In terms of investments, if you don't have much money, then forget about them. If you have money, besides normal savings, it should be invested in those things which bring greatest satisfaction — your work, life, family, land, passion, art, or love.
- If you have lots of money, then invest in those things which put your mind perfectly at ease. Any investment which makes you worried, fretful, or fearful is a bum investment, irrespective of the return. You lose mental equanimity for a few bucks.
- If you need capital and don't have it, demonstrate the utility of your goods and services on the smallest scale possible. Then find a backer and demonstrate it on a somewhat larger scale. Always work in increments and never allow the doom/gloom chronology of you-got-to-do-something-fast affect superbly rational planning and well-moderated growth.
- Always leave enough time in your life to do something that makes you happy, satisfied, or even joyous. That has more of an effect on your economic well-being than any other single factor.
- And lastly, read about the economy. Whether we like it or not, it is, in the words of my friend Peter Coyote, becoming the central organizing principle of the decade if not the balance of the century. Ignorance will simply concentrate economic power in the hands of a few. Intelligence is required everywhere. That's what makes disintermediation and an informative economy work. ■

## Tiptoeing out of Real Estate

**Why "tiptoe?" You don't want to make too much noise as you divest "the best single investment any individual can make." The problem with real estate, especially residential real estate, is that it was a good investment. So good that everyone tried to buy a piece of real estate during the '70s. Houses were bought and sold with the grace and alacrity common to a fruit stand. People bought "up," bought "across," people bought because their old house had too much equity, and people bought because they didn't have any equity at all. Condos, timesharing, duplexes, townhouses. You couldn't go wrong.**

**The problem is that this five-year feeding frenzy has just about exhausted the supply of capital available to loan out to buyers for mortgages. During the past few years, Americans have shifted their money away from 5¼% accounts at the S & L (Savings and Loan) to T-Bill (Treasury Bill) certificates and money market funds yielding close to the prime rate. At these rates, S & Ls can't make mortgage loans, and many have stopped. So mortgage money is hard to get or real expensive. Part of the reason that buying made sense was that the interest on the mortgage was small enough to justify the purchase. It was like rent. But now with 16% mortgages (if you can get one), interest on a $100,000 mortgage amounts to big bucks. When you throw in taxes, insurance, principal, etc., it could cost $1500 to 1600 per month to "own" a $135,000 house after putting $35,000 down. That's a hard sell when the house rents for half as much. But if you believe real estate has nowhere to go but up, why not?**

**The best example is my own house. It is a nice three bedroom converted music house once attached to a Victorian on the corner. We paid $80,000 for it some four or five years ago, and now it will sell for nearly $300,000. Since we owe $58,000 on it, we have nearly $240,000 in equity. We rent it out for $600/month and hassle with the leaky toilet and the old plumbing. My contention is that real estate has sort of leveled off. It won't grow in leaps and bounds because it is so dear to buy, expensive to own, and only economic if it keeps going up in price. But now that the means (inexpensive mortgages) are gone, it will be nigh impossible for real estate to achieve the same rate of appreciation. In fact, it could easily do the opposite. For someone like me, the best place to put $240,000 is not in a house, but in a savings institution where it will earn 15% because it has been loaned to someone who is paying 16% trying to buy a house. I would be getting $36,000 a year instead of $7200 and would not be paying any mortgages or taxes either. And the toilet wouldn't be leaking.**

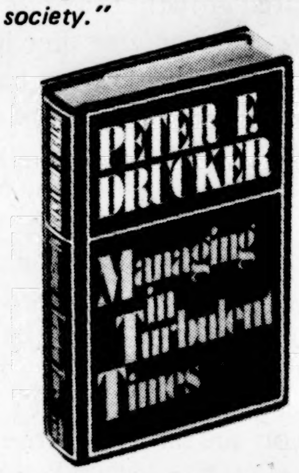
**We didn't buy it to make money, so we won't sell it for that reason either, but the point is the same. Real estate at present-day prices is not economical, and as people finally figure that out, it will go down in price until it is economical. If everyone figures it out at the same time, it will go down fast. That's why it's best to tiptoe.**

**—P.H.**

## Managing in Turbulent Times

*Peter Drucker may have the best crystal ball in the business. Because he focuses his effort on observing what really works in the world rather than on speculation, his insights last, and they easily make themselves at home in your own expectation structure. In this book he foresees (sees, actually — the phenomena are underway) a period of sudden shifts; of a growing labor force in developing countries and still growing markets in developed countries leading to greatly increased transnational "production sharing"; of a converging world economy leading to a world currency; of a diverging world polity (neither Canada nor the U.S.S.R., for example, are expected to be single nations by 2000 A.D.); of dethroning professionals and enthroning rank and file knowledge workers — "the employee society."* —SB

**Managing in Turbulent Times**
Peter F. Drucker
1980; 239 pp.
**$9.95** postpaid from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512
or Whole Earth
Household Store



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In turbulent times, it is essential to know the minimum liquidity needed to stay in business. What working capital does *our* business need to survive a ninety-day or hundred-and-twenty-day panic? After a hundred and twenty days of panic there is always a new "normality." But during the panic a business has to be able to stay afloat without outside help or it risks foundering.

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Increasingly, there will be people who look upon their job as a place to practice their special skill, and especially highly technical skills, and who look upon their employer — whether university, hospital, or business — as a "facility." Their "loyalty" and "allegiance" will be to their craft, their tools, their discipline, their methodology, rather than to a company, a university, a community.

●

Production sharing is the best hope — perhaps the only hope — for most of the developing countries to survive without catastrophe the explosive expansion of working-age people in search of a job. Neither capitalism nor communism nor any of the traditional theories of economic development has an answer to the unprecedented tripling of young people who reach working age and need jobs. The young people in the developing countries are not highly schooled or highly trained, to be sure. But they are better trained and better schooled than their parents were. More important, they are in the cities whereas yesterday's pre-industrial people were in remote and isolated rural areas. Forty years ago, when there was unrest in the countryside, the Mexican government dispatched a company of rural police. They shot and raped and spread total terror — then there was "peace and quiet" again. Nobody ever heard about the episode. The only newspapers were in the far-away capital city. Nowadays a fourteen-year-old boy in a remote pueblo hops the tailgate of a truck, and two hours later he is in a big city. Mexico has well over twenty centers, each with a population of 1 million people, whereas the Mexico of forty years ago had only Mexico City and perhaps, as a poor second, the port city of Vera Cruz. And in the city that Indian boy counts, and is both seen and heard. Every developing country has undergone a similar sea-change.

●

"Everybody knows" that eating out is cut down sharply when there is even the slightest quaver in the economy. A restaurant meal is many times as expensive as a home-cooked meal. The only additional cost of a home-cooked meal is time — and that, in a depression, "everybody knows" is in plentiful supply. But in 1973 eating out began to boom in America. Since then it has been doubling every two years, to the point where, by 1980, every other meal eaten in the United States is an "eating-out" meal — bought in a restaurant or a fast food facility; in institutional cafeterias, in the hospital, the school, the plant, the office, and so on; or bought as a fully cooked meal, ready to be served after being taken home.

The popularity of eating out is directly related to the increasing number of married women at work, for whom time is much shorter than money. It is also related to the increased number of older people in the adult population, for whom going out to eat is often the easiest way to escape confinement and to be "in the swim."

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The emergence of transnational money may signify a major turning point in political history and political theory. It may signal the end of "sovereignty." It may be the consummation of this century's trend for economics and politics increasingly to move in opposite directions.

●

The countries that believed the most strongly in the power of the national government to control and to build an autonomous domestic economy, the two Keynesian countries, Britain and the United States, have done the poorest. Japan and Germany tried to manage supply to fit the demands of the world economy; they succeeded. Britain and the United States tried to manage demand to fit domestic political goals; they failed.

## "Watch Out for the Foreign Guests!"

*This new book by a regular* **CoEvolution** *contributor has gotten the rave review treatment in New York, so normally we would not bother with further touting it. But I believe there is more to the book than the high insight and entertainment praised elsewhere. Politically China turned inside out overnight. Decades of shunning America became a lurch to embrace it. Astounded, delighted, worried — young China hand Schell reports the action at the interface, on the streets of Shanghai with cool characters in home-crafted pseudo-Levis, at a Texas rodeo with Deng Xiaoping (a touchingly real encounter, it turned out), at Disneyland as Minnie Mouse tries to embrace Fang Yi, minister of science and technology (a hideous embarrassment for all except the oblivious Americans), in newly-cordial Peking meeting a brilliant young Chinese woman determined to make herself at home in both cultures.*

*Read this book and you won't be so surprised by the future.* —SB

**"Watch Out for the Foreign Guests!"**
(China Encounters the West)
Orville Schell
1980; 178 pp.
**$9.95** postpaid from:
Pantheon Books
Random House
400 Hahn Road
Westminster, MD 21157
or Whole Earth
Household Store

Out for the Foreign G
ORVILLE SCHELL

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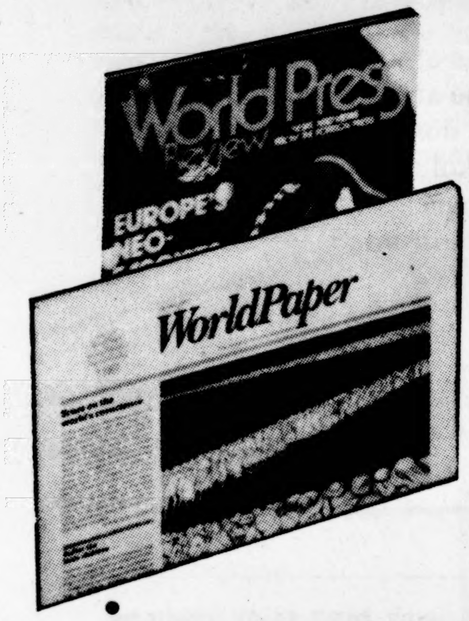
Standing alone in the vastness of Tiananmen Square as workers, bicycling past, craned their necks in wonderment, Hope belted out his gags.

"Take a look at it!" Hope told his American viewers, gesturing across the square toward the Great Hall

## World Paper
## World Press Review

*The first is a new tabloid, the second an experienced slick. Both demonstrate that the rest of the world outside America knows considerably more about itself than America has much inkling of. Both are an exciting relief from the boredom of America's self-obsession.* **World Press Review** *is more fun to read,* **World Paper** *is more serious. Each does well by its format.* —*SB*



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●

**The forest closes in on millionaire Ludwig**

SAO PAULO — A letter, classified as "arrogant" by some members of the Brazilian government, was sent a few months ago to General Golbery do Couto e Silva, the gray eminence behind the Brazilian president, General Joao Figueiredo. The sender was the 83-year-old multimillionaire, Daniel K. Ludwig, a reticent American who some years ago began an audacious, controversial and politically hot development called Projeto Jari in the middle of the Amazon forest in northern Brazil.

The letter signaled a dramatic shift in Ludwig's position. The Jari development was started in 1967 with the proud announcement that it would not need any outside financial help. Now, in open and almost crude words, Ludwig asked for the backing of the Brazilian government to complete the development. It was the first official sign that the tough-minded and intensely shy ship owner and industrialist was losing what **Time** magazine called "Billionaire Ludwig's Brazilian Gamble."

The stakes have been, and still are, very high. In 1967 Ludwig paid $3 million (US) for the Jari Industria e Comercio Ltda, whose main assets were roughly 4 million hectares of land near the Jari River. His plans included a huge reforestation project, production of pulp for making paper and rice fields. About $1 billion has since been invested with disappointing results. . . .
**—World Paper**

WORLD PRESS REVIEW

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Moscow setbacks. North Korea appears to be slipping further from Moscow's orbit and closer to the Chinese. The latest evidence of the shift — already suggested by Pyongyang's criticism of the Soviet-backed Vietnamese invasion of Kampuchea and its silence on the Afghanistan takeover — came in tributes to "[our] close neighbor and class brother, the Chinese people" — at the Congress of the North Korean Communist Party [**The Hindu**, Madras] . . . . This is only one item in a lengthening list of woes: Poland, Afghanistan, Ethiopia, China, Iraq, and southern Africa (where Moscow has yet to establish an embassy in Zimbabwe, and Mozambique is only "a polite friend"), plus food shortages and a sluggish economy. The result is an aging leadership "bowed and stooping before a sea of problems as never before" [**The Guardian**, London].
**—World Press Review**

●

"Baby hotels" are booming in Japan, where in Tokyo alone some 200 round-the-clock nurseries now care for the infants of working mothers. The trend has paralleled the increase in self-employed women who must leave home at odd hours or on business trips [**Strait Times**, Singapore]. **—World Press Review**

●

BEIJING — Should a country with a quarter of the world's population become a "card" for another nation to play in a diplomatic game? The idea sounds a little strange, doesn't it? Yet it is exactly what some political circles in the United States mean when they talk about playing "the China card."

*Chen Si is a staff writer for* **China Features**, *Beijing.*
**—World Paper**

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of the People. "It looks just like Jackie Gleason's patio." He might as well have been standing in front of St. Peter's Basilica in the Vatican comparing it to the Houston Astrodome.

"Hey! This is it! Peking, China!" he continued, accompanied by a laugh track in no way related to the quizzical comrades gliding by him.

●

If China's sense of itself was too one dimensional and rigid during the last decades of Mao's life, after his death and the fall of the Gang of Four it moved in the opposite direction until it became fragmented and China seemed to wobble on its cultural political axis, as if a stabilizing gyroscope within was slowly losing rpm's.

Now, with Mao debunked and Bob Hope soft-shoeing on the Great Wall, it is not at all clear what new and cohesive force will give unity and direction to China's one billion people, so that they will not, like mercury hitting the floor, splatter off to all points of the compass. The image of "a sheet of loose sand" used by Sun Yat-sen to describe China more than fifty years ago is still an apt one.

●

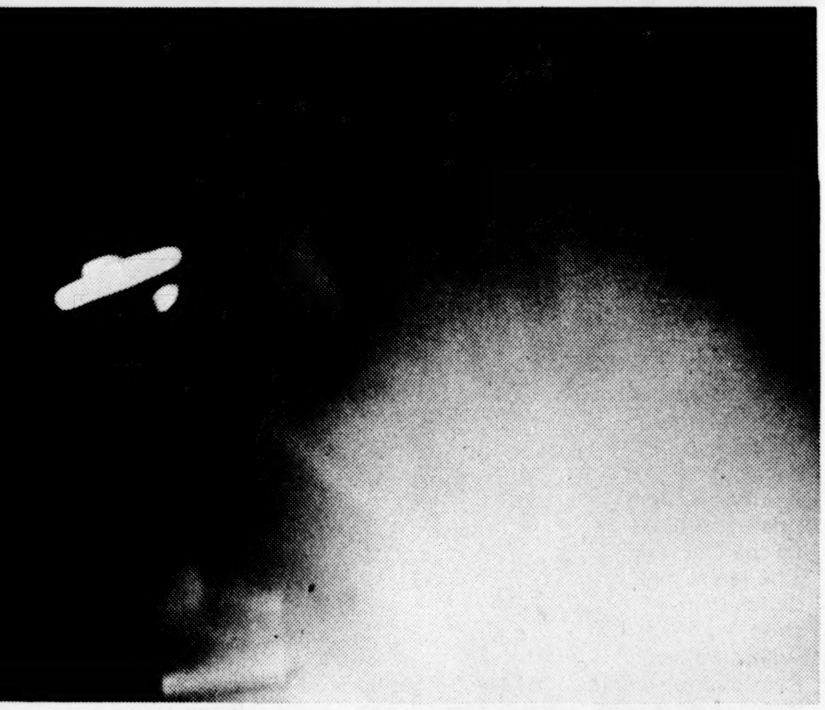
"Why is our life so boring when Western life is so rich?" one young woman asked me in the Peace Café, confessing that she was transfixed by what she had seen on Chinese TV when Deng Xiaoping visited the United States.

●

As I leave Fang's stateroom, I am still wondering whether this generation of Chinese will be any more successful than its predecessors in separating off the *yong*, or practical aspects, of American technology from the companies and culture which will export them. Fang's single-minded determination to see his country modernize is indeed impressive. But I am perplexed by the way that he and others evade any discussion of the possible consequences of their policies, the way they have so facilely "reversed the verdict" on Mao's ideology of self-reliance, suggesting that apparent contradictions are actually only in the mind of the beholder.

Confronting China since Deng's rise to power is a little like meeting an old friend who has been so totally transformed by a new religion or cult that you begin to doubt you ever really knew him.

## Why We Should Drop the Bombs



it would be so exciting
it would be so powerful
it would punish us for our sins
things wouldn't be so boring anymore
we could get back to basics
we would remember who we love
it would be so loud
it would be so hot
the mushroom clouds would rise up
we could start over
we wouldn't have to be afraid of it anymore
we wouldn't have to be afraid anymore
we would finally have done it
better than Raskolnikov
it would release our anger
in the ultimate tantrum
then we could rest

—Alia Johnson

*Alia Johnson lives in Berkeley, works night and day to defuse the Arms Race. Her method is truth, sampled here.* —SB

## Political eyepatches

Two recent newspaper items report:

1.
That if an H-bomb went off (for instance) in the Boston area anyone within a 40 mile radius, unfortunate enough to be looking in its direction at the time would be blinded by retina burn.

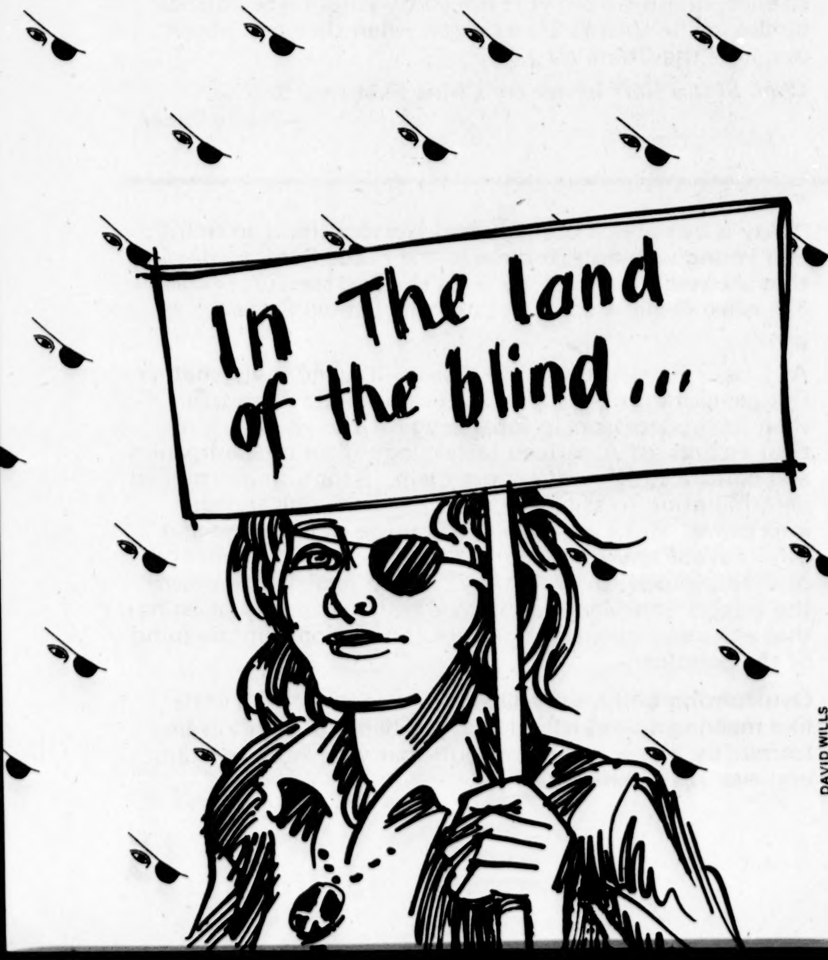
2.
That the pilot of the Air Force's SAC flying command post wears an eye patch at all times so he'll have sight in one eye when/after he gazes at an H-bomb going off somewhere above the U.S.

Whether people should want to survive into the chaos post-nuclear-war may be moot, but survival blind may be just that straw that breaks the camel's back.

I'm suggesting that the eye patch, black as ink, might be an excellent symbol for public display by those who'd like to protest nuclear idiocy, unforgettable if worn by hundreds or thousands at a gathering, and yet a protective item of substance: real theater.

Think of Israel's Dayan, that Man in the Hathaway shirt and many, many more all come to town on the very same day.

Charles Pierce
Dunedin, Florida


In The land of the blind...
DAVID WILLS

## The Short-timer's Journal No. 1

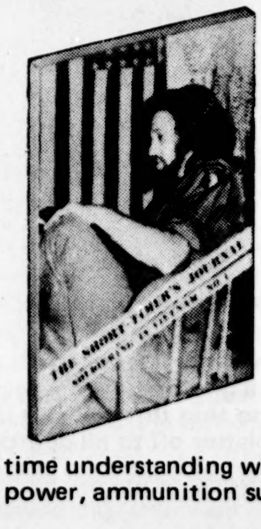
*As an ex-infantryman (officer, peacetime) I've watched the Vietnam accounts with a certain attention almost envy. This document from the Winter Soldier Archive is the strongest truest yet. Steve Hassna, a grunt in the 101st Division, pointman, tunnel rat, later a drill sergeant, compresses more experience into a paragraph than any other writer I can think of.*

*If you're eligible these days, you might read this and join the Army or you might read it and fight the draft to your last breath (as the author would prefer), but the main thing is you'll have the facts.* —SB

*[Suggested by Steve Thatcher]*

**The Short-Timer's Journal No. 1**
(Steve Hassna's Story)
1980; 113 pp.
**$3** postpaid

Subscriptions to the Short-Timer's Journal
**$15** /year (6 issues)
both from:
Winter Soldier Archive
2000 Center Street
P.O. Box 1251
Berkeley, CA 94704



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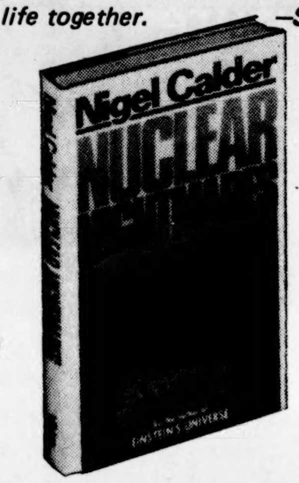
Americans have had a hard time understanding why — with our superiority in fire power, ammunition supply,

## Nuclear Nightmares

*Detailed, gracefully presented, here in full plausibility is the existential crux of our time — how, in so many different ways, we can blow it. Science writer Calder explores four of the ways: escalation in Germany; small nation against small nation; failure of the technical control systems of the poised weaponry; and intercontinental duel.*

*Humans used to worry only about their own deaths and deaths in their family. It was considered salutary to face clearly one's fatal prospects. Now we contemplate the convulsive death in hours of all civilization. Is there nothing salutary in that? I think there is. It leads to a sort of geopolitical Gaia Hypothesis: if we can die one death together, we live one life together.* —SB



**Nuclear Nightmares**
(An Investigation Into
Possible Wars)
Nigel Calder
1979; 168 pp.
**$10.95** postpaid from:
The Viking Press
299 Murray Hill Parkway
East Rutherford, NJ 07073
or Whole Earth
Household Store

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In the densely populated plains and valleys of Central Europe the nuclear soldier finds himself badly cramped. As one of them complained to me, with legitimate hyperbole, "German towns are only two kilotons apart."

•

The present joker in the pack is Pakistan, the first Moslem country to be busy making its own nuclear bomb. If, in the early 1980s, Israel used or threatened to use nuclear weapons against its Arab opponents, it could well be countered by the Pakistani bomb, not necessarily in the hands of the Pakistani Air Force. For example, if Saudi Arabia and Libya help to pay for the Pakistani nuclear weapons, they may expect eventually to receive some weapons as repayment in kind. Even then the nominal owner of the bombs need not be the one who uses them, least of all among the coreligionists of Islam. There would be nothing to prevent the "lending" of Pakistani nuclear bombs to Syria, say, during a war with Israel, or of Saudi Arabian bombs to Jordan. The Libyans might equally well sublet their bombs to a terrorist group. This shuffling of nuclear weapons between friends is not wholly different in principle from what goes on in Europe, but the opportunities for nuclear anarchy are much greater in the Middle East.

•

Spurning all military subtleties and demographic nitpicking one can say that roughly half of all Americans, and a similar number of Soviet citizens, die in an all-out nuclear war. The American and Soviet nuclear weapons in Europe do not remain idle, and the British and French submarine-launched missiles may not neglect to stoke the fires of Moscow. When the European volcano erupts, roughly half of all Europeans die too. The Soviet Union, perhaps spiteful at the thought that its Oriental rivals look set to take over the world, probably takes a sideswipe at China and Japan and absorbs the Chinese missiles in response.

The "decapitated" nations finish the fight quite mindlessly. Of the 50,000 nuclear weapons available for war, any that are not destroyed or left lying in crippled delivery systems will be dispatched by vengeful men. Out of battered silos and the ocean depths and neglected airstrips come forgotten warheads, badly aimed, to pick like vultures over the corpse of our civilization. Five hundred million dead around the Northern Hemisphere seems a conservative estimate for all the exchanges. And those are just what war-gamers call the "prompt" casualties — men, women, and children punctual enough at doomsday to escape a lingering death.

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logistics, helicopters, jet aircraft, heliborne assaults and fancy tactics like Search and Clear, Search and Seize, and Search and Destroy — why we couldn't seem to catch these people with their pants down. Part of the reason why is because of the tunnel building art. Certain tunnels the Vietnamese would build would be carved in the side of a bluff of a hill. They were round, cone-shaped at the opening, making an area maybe six by six by six at the base of the cone. They would be built usually overlooking a large wide-open valley. At the base of the cone, tunnels would run off in different directions.

If you were to sit in one of these little cones, you could hear choppers coming 15 miles away. They reacted like a natural ear with near perfect acoustical balance. A Vietnamese experienced at listening was able to check which way the helicopters were coming from and sometimes even approximately how many helicopters there were. And there'd be maybe three of these cones, 50, 75, 100 meters apart. In fact, the people sitting in these cones would triangulate. Or, maybe they'd have a couple here and over on a far hill, 500 meters away, there'd be another set of cone tunnel complexes. By coordinating between the two cone complexes, they'd know which way the choppers are coming, how fast, approximately how many, sometimes even what type. The big Chinooks would make a certain sound; the Hueys made a certain sound; the Marine choppers made a certain sound. Big skyhooks, Cranes, they made a certain sound. With individual helicopters giving off a distinct sound in the air, Vietnamese could identify and triangulate their approach, estimate the size of the attacking force, and have all that down while you're still ten miles out. You don't even know where you're going, and the Vietnamese know you're coming.

•

50% of the dead and wounded of the Vietnam War was caused by American fire on American personnel.

•

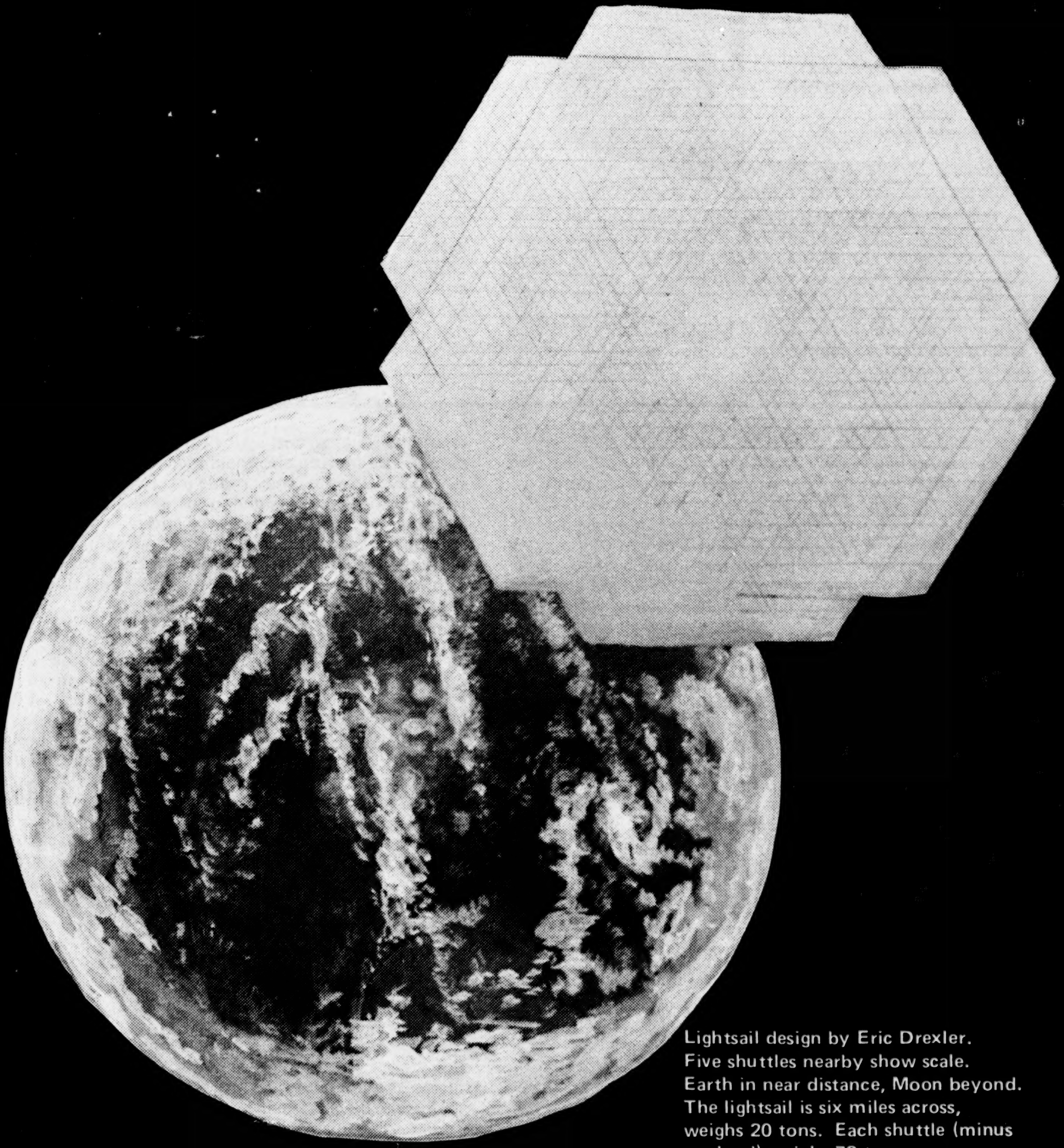
I came out of the Army in a state of limbo. I had no feelings, except I didn't want to be bothered. Pretty soon I started seeing the contradictions and other things started flashing on me. These pictures of Vietnam started coming back into my head. I started having a lot of problems with dreams. I used to wake up in the middle of the night screaming. I'd throw my wife out of bed; I'd be trying to pull her into the bunker. My wife wouldn't let me go see any kind of movie that involved any kind of violence. If we were watching television or a movie came on the television that was about war or violence, she'd quickly turn the channel, while I started shaking. One time, a month after I'd gotten home from Vietnam (when I was on leave), we decided to go to a flick. I didn't even know what the movie was, except that it was called **Bonnie and Clyde**. I'm sitting there watching and they start a gun fight. I just saw the jungle again. I just started shaking and jumping around; I flipped out right in the middle of the theater. She dragged me out. I went around for almost three years not knowing what the hell was wrong; I thought there was something wrong with *me*.

**Drill Sergeant Hassna at Fort Campbell**

# America in Space:

## Boondoggle past, ho-hum present, ephemeral future

*by Eric Drexler*



Lightsail design by Eric Drexler. Five shuttles nearby show scale. Earth in near distance, Moon beyond. The lightsail is six miles across, weighs 20 tons. Each shuttle (minus payload) weighs 78 tons.

ONCE UPON A TIME, two superpowers wanted to lob hydrogen bombs at one another from halfway around the curve of our planet. They built big rockets to do this. One used a military rocket to lob a satellite clear around the Earth (and around, and around, and around . . . ); the other (that's us) decided to build a special, symbolic "civilian" rocket. They came in second and were terribly embarrassed. So, to prove how smart and rich they were, they did a stupid thing with great cleverness and expense. It's not very politic to point this out (though the truly responsible parties are dead), because the myth of the space program asks us to worship stupidity merely because it was carried out with genius. This tends to rot the mind.

Since the earliest days, science fiction writers assumed that people would build spaceships as a natural extension of airplanes: winged vehicles that flew higher and faster. They assumed that people would build space stations just outside the atmosphere, where things could be built such as spaceships without wings (wings are dead weight for ships that don't have to land on Earth), and where people could learn to live in space. There, we would build the ships to go to the moon. But, we were stupid. I should say, our leaders were stupid, since people already had some pretty sensible ideas about what to do in space.

Our leaders, embarrassed as they were, wanted something dramatic. So, they decided to send a citizen to the biggest, brightest thing in the sky that wouldn't burn 'em up. They wanted to do it fast, so they told their engineers to build bigger missiles instead of learning to build spaceships. So, the country poured tens of billions of dollars into huge missiles good for nothing but the stunt of getting to the Moon and back, instead of building spaceships or a space station. They told the public this was "The Space Program," and the public believed them. Once it was done (we got to the Moon, so it was done), the public looked at the cost, looked at the results, (a flag on the Moon, a few rocks), heard Spiro Agnew propose flying to Mars at several times the cost, and decided they had had enough.

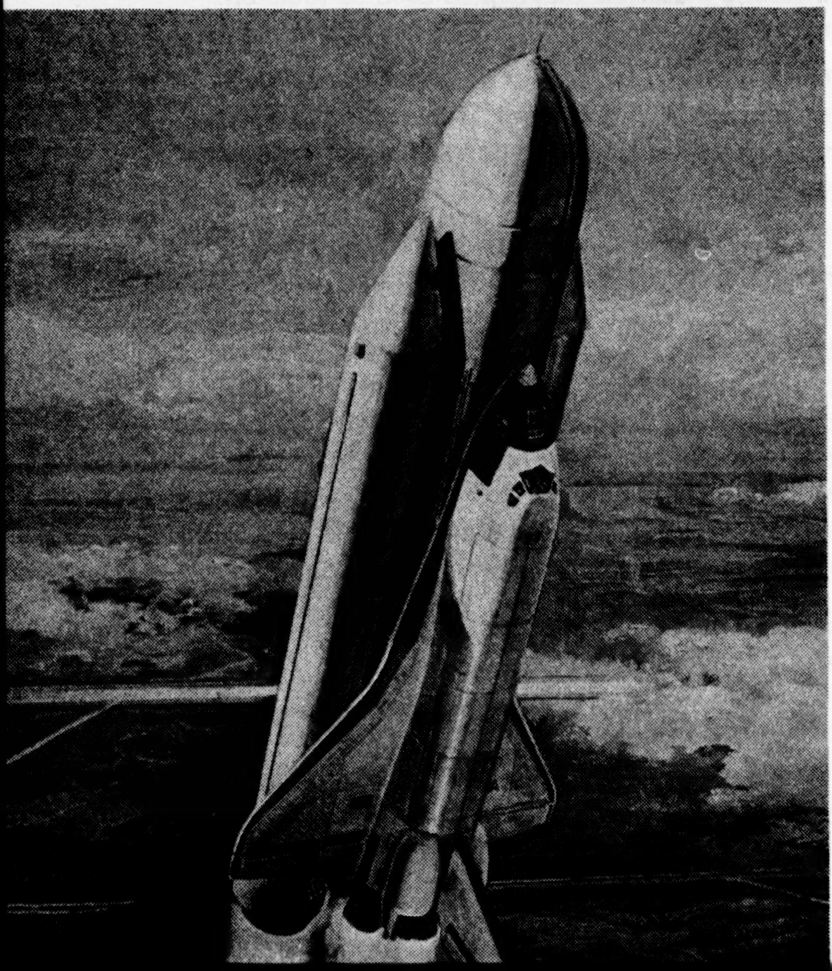
The moon rockets were scrapped (who needs a stunt machine after the stunt?). People concluded we were trapped on Earth for all eternity. The limits-to-growth cry went out, and the next decade got more and more depressing. Particularly for those of us who dreamed of the stars.

## Something New Is Afoot

LAST SUMMER, I FLEW west on a Boeing jet to the Boeing Aerospace Company to visit a friend in their space group. Pictures of spaceships with wings covered the walls.

For the last eight years or so, our country has been building half a spaceship, the Shuttle. I say half, because only part of it flies back and the rest ends up in the ocean or as dust in the stratosphere (if you don't like dust, please send your complaints to Mt. St. Helens). By building real spaceships, Boeing (the people who brought you cheap air transportation) believes it can drop the cost of space launches down by a factor of a hundred or so below that of the old moon shots. Everyone else who has looked at the problem agrees.

A technical miracle? No — just simple economics. If President Kennedy had decided to send an



**The Space Shuttle — brute force propulsion, extremely limited range.**

*In honor of the first orbital test of the Space Shuttle, let us note what a fine but inadequate space vehicle it is, as is NASA. The whole sequence of Presidents since Johnson has down-graded U.S. space activities (except for military application, which is flourishing). An increasingly restive populace and legislature is pressuring the new chief executive for more boldness in space, whether to any effect remains to be seen.*

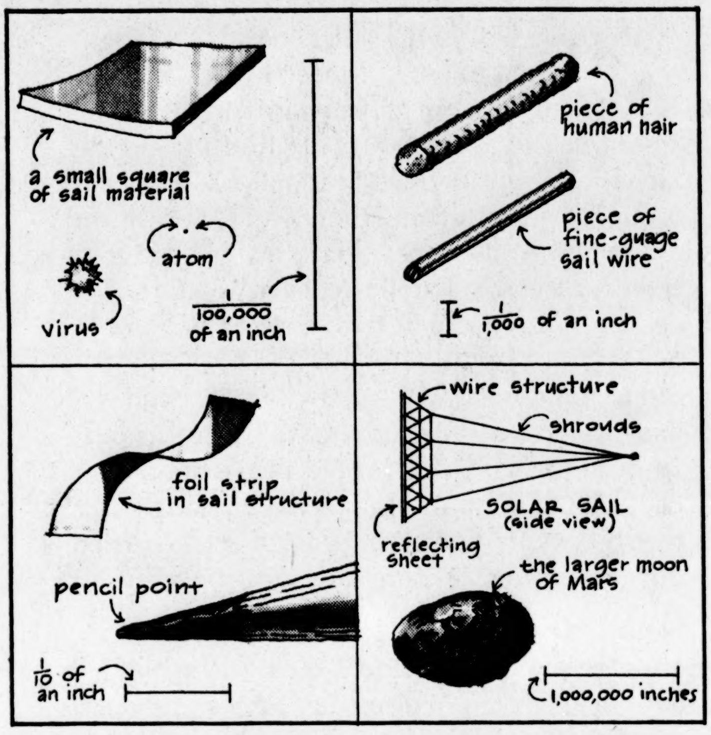
*Eric Drexler, a young space turk out of MIT, here reviews our glorious past in light of what it could have been. As a well-regarded designer of "lightsail" space vehicles, he speaks with some authority.* —*SB*

American to London "and return him safely" by developing, using (and scrapping after one use), a half dozen 747s, charging the whole cost of everything against the ticket price, everyone would now "realize" that air travel was an impractical dream best abandoned. On the other hand, if we build a space transportation system that doesn't throw away its vehicles after using them once (talk about a consumer mentality!), and run it on a decent flight schedule (so as not to have thousands of people trained to prepare launches sitting on their hands at high salaries for months at a time), space travel can be cheap too. Sure, space launches take more fuel, but fuel costs were about one thousandth of the cost of a moon shot. Simple economics: a spaceship is just an airplane that flies higher and faster. Build it that way, use it that way, and a launch won't cost outrageously more than any other flight around the world.

But space begins only a few hundred miles over our heads, while the solar system stretches hundreds of millions of miles into the deep black sky. Winged rocket spaceships can bring us into the harbor of low orbit, but cannot set sail for far shores.

Rockets face a nasty problem in getting up to really high speeds, such as those needed to break free of Earth's gravity and to climb closer to or farther from the Sun. They run out of gas, even if they are mostly tanks of fuel to begin with. To go faster requires fuel to move the fuel, and then fuel to move the fuel to move the fuel. This gets inefficient fast. In fact, the amount of fuel needed increases exponentially with the speed to be achieved. Hauling all this fuel from Earth gets expensive — you might be willing to pay to throw a camera past another planet for a closer look, or even to throw a smaller rocket to another planet to bring back a few ounces of dirt for scientists to scrutinize, but as for bringing back anything useful, forget it. Even if Mars were red from gold dust, forget it, if the fuel has to be hauled up in the Shuttle.

Electric rockets or nuclear rockets can improve the situation somewhat, by making the exponential growth less steep, but a real solution to the problem is to scrap rockets for orbit-to-orbit cargo transportation in the inner solar system and use sails instead: NASA looked at this in the late 1950s and early '60s. A sail, or "solar sail" is a huge mirror in space. As Doctor Einstein told us, energy has mass, so when light bounces off something it exerts a weak pressure (a few pounds per square mile). This may not seem like much, but if the sails are light enough, they move quite noticably in a single second — and are moving twice as fast after the second second, and sixty times as fast after the first minute . . . and so on for months.


a small square of sail material
atom
virus
$\frac{1}{100,000}$ of an inch
piece of human hair
piece of fine-guage sail wire
$\frac{1}{1,000}$ of an inch
foil strip in sail structure
pencil point
$\frac{1}{10}$ of an inch
wire structure
shrouds
SOLAR SAIL (side view)
reflecting sheet
the larger moon of Mars
1,000,000 inches

DON RYAN

If sails can be made light enough and cheap enough, they can compete with the most ferocious gas-core nuclear rocket engine on the drawing boards.

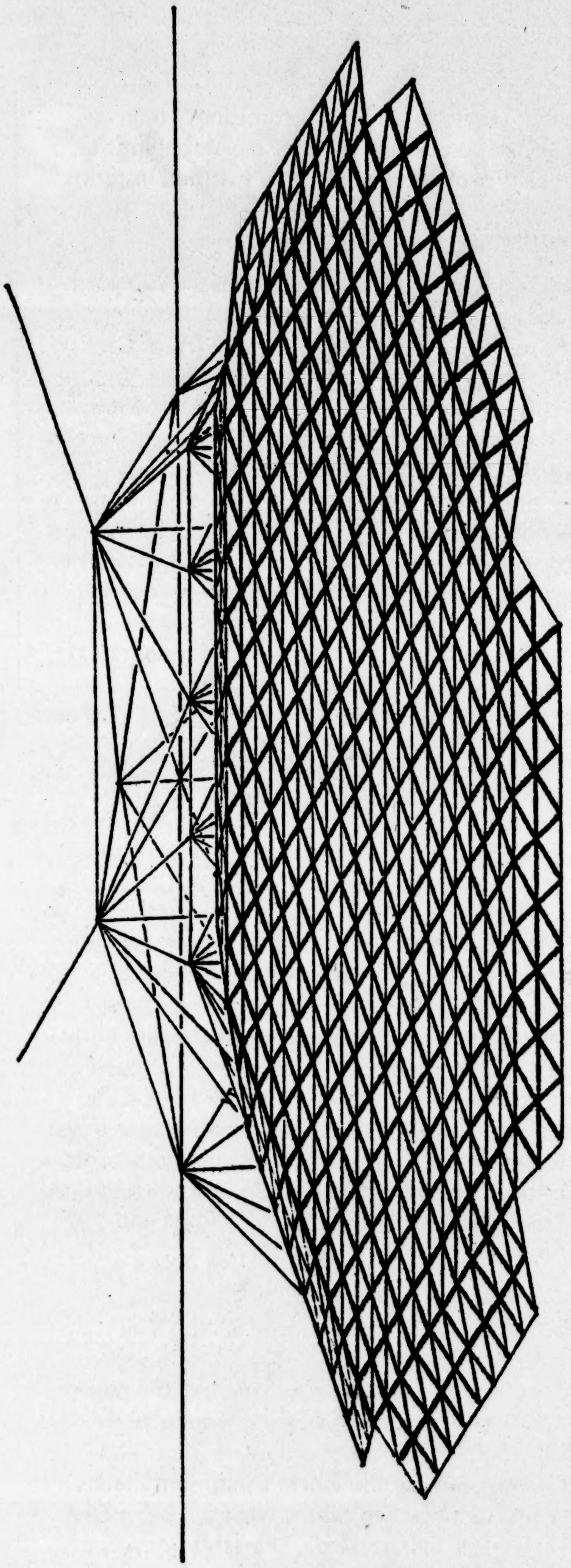
## From Solar Sails to Lightsails

SINCE THE LATE 1950s, interest in solar sails has ebbed and flowed. Early ideas were forced into a restrictive mold by early launch capabilities and the effect of the disastrous Apollo approach on space development: everyone assumed that sails must be made on the ground, folded into a tiny package, and thrown into space in the nose of a rocket, there to spring open into a vast mirror. The requirement for a folding structure limited designs, and all this folding and unfolding (or rolling and unrolling) turns out to limit the materials that can be used to toughen reflectors — like aluminized plastic film.

Now, with the shuttle era coming (if not here, then in the Soviet empire), it seems time to give the matter a second thought: What can we make if we build in space?

To make a long story short, we can replace aluminized plastic with aluminized nothing, can build an efficient pure-tension structure, and can therefore build sails a factor of 20 to 80 lighter than those previously proposed. (Or so it seems.) This is revolutionary: suddenly sails have 20 to 80 times the acceleration, and cost 1/20 to 1/80 as much to launch into orbit. I call this new class of solar sail a "lightsail," to avoid confusion with less radical proposals.

Such a lightsail could haul stuff from orbit to orbit around the Earth (the Shuttle just barely gets into low orbit; many satellites must go far higher), from orbit to orbit around the Sun (visiting planets, comets, and asteroids), or could throw stuff out of the solar system or into the Sun.



**Drexler's lightsail design, with rigging. In Space Colonies (published by and available from CoEvolution for $5), Drexler spelled out how the manufacture of ultra-fine materials can be readily accomplished in the zero-gravity vacuum of space.**

Because it needs no refueling, it can reach orbits beyond the ability of rockets. Where a rocket can go easily, the sail can go for about 1/1000 the cost (the numbers are rough; perhaps only 1/100 the cost — but this is still like getting gasoline for a penny a gallon). Other rough estimates show that the lightsail construction loft in orbit may cost around or under a billion dollars to design, test, and launch — a small fraction of the cost of the Shuttle (which is in turn a small fraction of the cost of Apollo).

Wispy metal foil hung on a vast spiderweb of graphite thread isn't most people's idea of a spaceship (spaceships are pointy things with fins, ask anyone). But, then, design for space is just beginning.

## Gossamer Spacecraft

FOR A FEW DAYS IN THE CLOSING month of the 1970s, the Jet Propulsion Laboratory in Pasadena (the people who bring the planets to your TV screen) hosted a meeting on "Gossamer Spacecraft." They discussed deployable, plastic solar sails, and the depressing lack of interest shown by NASA. They discussed projects to build them with time, materials, and money coming from interested citizens and groups, to avoid the frustration of selling anything new to NASA these days. They discussed the lightsail proposal, were amazed at the greatly improved performance it offers, and failed to find any technical obstacles to developing it.

This meeting discussed a range of novelties beyond sails. Consider long, strong cables in space. Hang one down aways from low orbit, and you can dangle instruments down into the atmosphere. Hang one from one orbit to another, and you can climb up. Let's say you're in orbit around a small, airless body and want something from the surface without landing: you climb out, spin your lasso, and . . . .

Or consider blowing bubbles in space that dry to plastic: How large can they be made? What might they be good for? How can we find out?

Or consider building radiotelescopes in orbit: with no wind or gravity, engineers agree that they can be huge, light, and precisely shaped. The most promising approach involves tweaking a sheet of metallized plastic or metal mesh into shape with electrostatic fields. Some think a single Shuttle launch could orbit an unheard-of kilometer-diameter dish.

You won't find it in the conference proceedings, but many of us attended a special session on interstellar flight the second day. The discussion centered on systems that could radio reports from the stars within thirty years of launch: no one disputed the possibility. Propulsion ideas included nuclear pulses, antimatter pulses (small explosions behind push the ship forward), launching a probe from a gun about the size of the solar system, and Freeman Dyson's favorite: a lightsail pushed by a huge laser, that could keep accelerating far into the darkness of deep space.

## NASA and the Lightsail

THE COST OF REACHING SPACE can be cut by a factor of 100 or so. Lightsails can cut the cost of getting around in space by perhaps a factor of 1000. The riches of space, both energy and materials, seem within reach at last, yet NASA teeters on with declining budget and aging upper echelons pouring everything into an under-funded, half-reusable Shuttle while their best people abandon ship. You can perhaps guess with what imagination and enthusiasm they have embraced lightsails.

Over the last year or so, I have given talks at NASA centers, aerospace companies, and universities on lightsail technology. No one has come up with a new problem that doesn't amount to observing "Gee — these have to built in space. That's going to take some engineering work" (like the Solar Power Satellite, or large space antennas, or other things planned for the next ten years or so). A NASA in-house review of the concept labeled it "highly promising," then proceeded to observe that the development of such sails probably couldn't be justified in terms of their presently planned missions. THEIR PRESENTLY PLANNED MISSIONS?!?!

Many questions come up about the new design:

- Can films be made that thin (thinner than a soap bubble)? Yes.
- Do they have decent strength? Yes, I've made some, and taken them from coast to coast in my luggage.
- Are the films still reflective when so thin? Yes.
- Will fast moving atoms from the sun knock enough atoms from the film to destroy them quickly? No.
- Will this stream of atoms exert destructive forces on the sail during solar storms? No.
- Will electric charging or magnetic fields cause problems? No.
- Will the films be able to stand the temperatures they reach in the inner solar system? Yes.
- Will meteoroids destroy the films quickly enough to matter? No.
- Will they destroy the wire mesh that is the structure of the sail? No.
- Can the films be mass-produced in space at low cost? Yes.
- How much does the device for making the films weigh? It's manageable.
- What trajectories can the sails fly on? Name it.
- Could the sails possibly find use for near Earth transportation, as well as deep space? Maybe.
- Will the sails ripple under light pressure and gradually tear themselves apart? No.
- How well can the sails be turned to point where you want them to? Well enough.
- Will stresses from changing temperatures cause problems? No.

Imagine a world where gasoline costs $100 per gallon, and is used only in race cars. Now imagine going to the Department of Energy (Race Car Fuels Bureau), with a process to produce gasoline for 10 cents per gallon. They ask you how much it will cost to build the plant, you answer "maybe as much as a billion dollars — probably less." They note that race cars presently operating can't use enough gasoline to justify such an expensive plant, and tell you to get lost. You start to talk of replacing the few coal-burning railroads with clean, inexpensive "trucks," burning gasoline, and the head of the RCFB (an old racer himself) looks back in amazement — everyone *knows* gasoline is too expensive for anything but race cars.

Everyone *knows* that space operations are too expensive for large-scale enterprise in space to be economical. Apollo *proved* it, remember? (No arguments now, you're not supposed to be thinking.) And, since *everyone* knows this, Congress keeps NASA on a lean budget. With little money, little is planned in space and new technologies are shelved. NASA's better people start to leave. With no missions, ordinary solar sails can't be justified, much less the ambitious lightsail. With no lightsail (or advanced shuttle, or . . .) space operations remain too expensive for large-scale enterprise in space to be economical. Space travel is too expensive to do anything big in space, and since there's nothing much to do in space, why do we need cheap space travel?

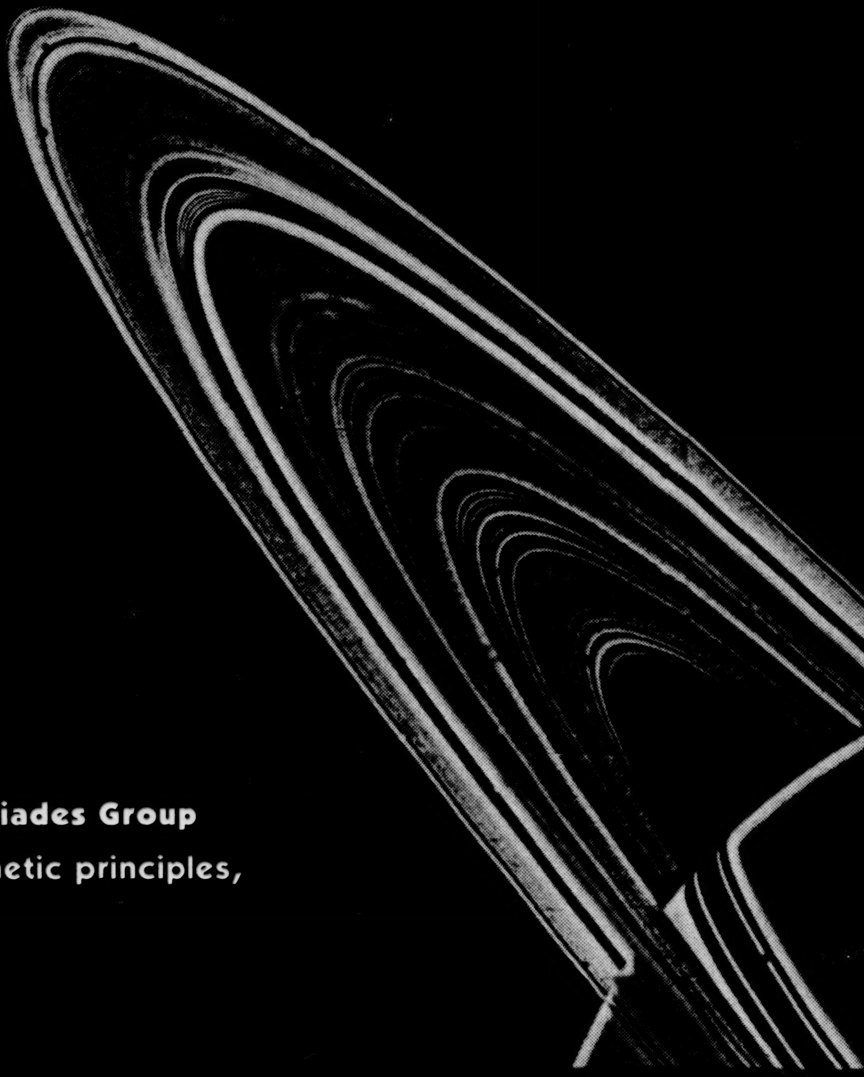
Well, asteroidal steel contains nickel worth over $2/lb and cobalt worth about $5/lb., while sails offer transportation costs under $1/lb. The struggle over the remaining mineral resources of Earth could precipitate world war, yet the heavens remain rich. A ton of this steel contains over $1000 worth of platinum group elements and gold — over 90% of the world's platinum metals come from Russia and South Africa. Ultimately, the skies offer living space. The asteroids alone — mere debris left over from forming the planets — could be reworked into space colonies equivalent to a thousand new Earths, in time, if we choose the high road to the stars.

Yet we sit, raping our planet and stagnating when we could lift the burden of heavy industry from the biosphere, open a new frontier, and carry the torch of life to the very stars. A vicious circle has never bound a greater dream. ■

**SAVE THE RINGS!** *By Jon Alexander*
*Citizens for Space Demilitarization,*
*1476 California #9, San Francisco, CA 94109.*

# SAVE THE RINGS!

It is the year 2020, but our largest Resource Directorates still do not see clearly the dangers of indiscriminate ice mining in Saturn's Ring Plane. Since 2016, the Neural Polling Project has shown System-wide support for the establishment of CyberNet monitoring capabilities around Sol's most majestic planet. The Directorates have balked, citing cost factors, but the Pleiades Group remains unimpressed. Recent incursions by Outer System scoopships have diverted attention from evidence pointing to high level Directorate complicity in the Ring Instability Survey cover-up. Our research indicates large contributions from Earth's Vatican, which is known for its opposition to "soul-less" artificial intelligence. The CyberNet system makes extensive use of A.I., and the Pleiades Group suggests that very little intelligence of any kind is needed to see where the Directorates' interests lie.



Make your thoughts known to the intelligence that counts!

Support CyberNet deployment and

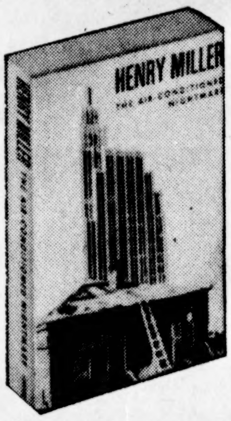
**SAVE THE RINGS!**

A public service transmission from the **Pleiades Group**
— Promoting a broader appreciation of aesthetic principles, from the microscopic to the macrocosmic

## The Air-Conditioned Nightmare

*Vacation reading for me — not for duty or for escape but for pure pleasure. The shock is that Henry Miller's observations of America 40 years ago have not dated a line. Shocking also that so much of the beatnik and hippie critique of the U.S. was not only anticipated but surpassed by Miller in the early '40s amid the nation's proudest war.*

*The eye and writing of Henry Miller is lucidity incarnate, the road of excess and the palace of wisdom simultaneous in his prose.* —SB



**The Air-Conditioned Nightmare**
Henry Miller
1945; 292 pp.

**$5.95** postpaid from:
New Directions
Paperbacks
W.W. Norton and Co.
500 Fifth Avenue
New York, NY 10036

or Whole Earth
Household Store

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Nobody on the outside, no, not even God himself, knows what a man suffers on the inside. There's no language to convey it. It's beyond all human comprehension. It's so vast, so wide, so deep that even the angels with all their powers of understanding and all their powers of locomotion could never explore the whole of it. No, when a friend makes a call on you you've got to obey. You have to do for him what God himself wouldn't do. It's a law. Otherwise you'd fall apart, you'd bark in the night like a dog.

•

The World Awake!

Just to repeat that to yourself five times a day is enough to make an anarchist of you. How would you awaken the world — if you were a musician? With a sonata for rusty can openers? Have you ever thought about it? Or would you rather remain asleep?

•

Death is one thing and deadness another.

•

There can hardly be any greater contrast between two regions in these United States, in my mind, than between a state like Ohio and a state like South Carolina. Nor can there be a greater contrast in these States than between two cities like Cleveland and Charleston, for example. In the latter place you actually have to pin a man to the mat before you can talk business to him. And if he happens to be a good business man, this chap from Charleston, the chances are that he is also a fanatic about something unheard of. His face registers changes of expression, his eyes light up, his hair stands on end, his voice swells with passion, his cravat slips out of place, his suspenders are apt to come undone, he spits and curses, he coos and prances, he pirouettes now and then. And there's one thing he never dangles in front of your nose — his timepiece. He has time, oodles of time. And he accomplishes everything he chooses to accomplish in due time, with the result that the air is not filled with dust and machine oil and cash register clickings. The great time-wasters, I find, are in the North, among the busy-bodies. Their whole life, one might say, is just so much time wasted. The fat, puffy, wattle-faced man of forty-five who has turned asexual is the greatest monument to futility that America has created. He's a nymphomaniac of energy accomplishing nothing. He's an hallucination of the Paleolithic man. He's a statistical bundle of fat and jangled nerves for the insurance man to convert into a frightening thesis. He sows the land with prosperous, restless, empty-headed, idle-handed widows who gang together in ghoulish sororities where politics and diabetes go hand in hand.

•

As John Marin said in a letter to Stieglitz once: "Some men's singing time is when they are gashing themselves, some when they are gashing others."

•

To know peace man has to experience conflict. He has to go through the heroic stage before he can act as a sage. He has to be a victim of his passions before he can rise above them. To arouse man's passionate nature, to hand him over to the devil and put him to the supreme test, there has to be a conflict involving something more than country, political principles, ideologies, etc. Man in revolt against his own cloying nature — that is real war. And that is a bloodless war which goes on forever, under the peaceful name of evolution. In *this* war man ranges himself once and for all on the side of the angels. Though he may, as individual, be defeated, he can be certain of the outcome — because the whole universe is with him.

↓ **Henry Miller in the park at Jacksonville**

# WORDS OF POWER

Formerly punk, formerly new wave, whatever it is lives on. I think of it as what happened when honesty met the Human Potential Movement and honesty won. Outside the big store through a door marked exit is a nameless alley worth more than . . .

This list is by Bob Black, a Groucho Marxist with an entity called THE LAST INTERNATIONAL that distributes broadsides to a marginally interested world from 55 Sutter Street #487, San Francisco, CA 94104. I found the item in the most recent issue of **RE/SEARCH**, 20 Romolo B., San Francisco, CA 94133.
—SB

| | |
|---|---|
| ART? | An increasingly inadequate substitute for sex. |
| BLOOD BANK? | Is there any other kind? |
| BOREDOM? | Obligatory for sophisticates. |
| THE BORN-AGAIN? | Twice too often. |
| CIVILIZATION? | The biosphere's skin disease. |
| CLASS WAR? | The war to end all wars. |
| COUNTER-CULTURE? | Less of more-of-the-same. |
| COUPLES? | Monogamy is monotony. |
| THE CRUCIFIXION? | Too little and too late. |
| CYNICISM? | Long since surpassed by events. |
| DISCO? | The bleat goes on. |
| DISEASE? | Very dangerous: a leading cause of doctors. |
| ELECTIONS? | Dumbocracy in action. |
| FAITH? | Is fatal — get thee behind me, God! |
| THE FAMILY? | No nukes! |
| FEMINISM? | Equality with men: a paltry ambition. |
| FREE TIME? | Work the boss doesn't pay you for. |
| FULL EMPLOYMENT? | A threat, not a promise. |
| GAYS? JEWS? | Elites impersonating the oppressed. |
| GOVERNMENT? | Guns don't kill, politicians do. |
| GURUS? | A good mantra is hard to find. |
| HIPPIES? | Running on empty. |
| THE HOSTAGES? | Not worth killing, not worth killing for. |
| JUDGES? | Doddering despots in clown suits. |
| LAW? | Crime without punishment. |
| LAWYERS? | Life-support systems for mouths. |
| THE LEFT? | Left behind. |
| LEISURE? | Paying & playing are mutually exclusive. |
| LIBERALS? | Conservatives with guilty consciences. |
| LIBERTARIANISM? | All the freedom that money can buy. |
| LIFE AFTER DEATH? | Why wait? |
| MARXISM? | The highest stage of capitalism. |
| MASOCHISM? | Like taking your work home with you. |
| MYSTICS? | Have incommunicable insights they won't shut up about. |
| NECROPHILIA? | A social disease. |
| NIHILISTS? | Going beyond good & evil, they stopped half-way. |
| PEDAGOGICIDE? | A victimless crime. |
| PLEASURE? | Interludes that accentuate pain. |
| POLICE? | Terrorists with the right credentials. |
| POLITICS? | Like a pond; the scum rises to the top. |
| PREJUDICE? | Folk sociology. |
| PROPERTY? | Is theft — and theft is proper. |
| PUNKS? | Hippies with amnesia. |
| PUNK "VENUES"? | Defoliated fern bars. |
| PUNQUES? | Punks who attend art school. |
| RADIO EVANGELISTS? | Less aural sects, more oral sex! |
| REAGAN? | A step in the Reich direction. |
| RELATIONSHIPS? | Being alone together. |
| RELIGION? | Deifying your defects. |
| THE RIGHT? | Wrong. |
| ROCK MUSIC? | Has a great future behind it. |
| R.O.T.C.? | Charnel knowledge. |
| SAN FRANCISCO? | Baja Sausalito.* |
| THE "SCENE"? | How to be different like everybody else. |
| SEX? | An increasingly inadequate substitute for masturbation. |
| SCHOOL VIOLENCE? | Class struggle as struggle in class. |
| SOCIALISTS? | Sheep in wolves' clothing. |
| TEACHERS? | Outclassed. |
| THERAPY? | Punishment without crime. |
| TROTSKYISM? | Stalinism out of power. |
| UTOPIA? | Nostalgia for the future. |
| VEGETARIANS? | You are what you eat. |
| ZIONISM? | Jewish Nazism. |

***Local joke. Sausalito is at the north end of the same Golden Gate Bridge that San Francisco is at the south end of. We Sausalitans are too dim to know if this definition is a slur on our chic little town or not.**
**—SB**

# COMPUTER Slang

SCOTT KIM

*Compiled by Guy L. Steele Jr., Raphael Finkel, Donald Woods, and Mark Crispin, with assistance from the MIT and Stanford AI communities and Worcester Polytechnic Institute. Some contributions were submitted via the ARPANET from miscellaneous sites.*

*There was an etymologist (word origin fanatic) who used to hang around San Francisco's North Beach in the height of the Beatnik era, listening and scribbling. Asked why, he said, "I always watch where new words are emerging. That's where the action is in a culture."*

*If he's still on the case I'm sure he's haunting the fluorescent-lit corridors of the Artificial Intelligence (AI) computer labs of the land, where intriguing new ideas are trying on humorous new words. I do not doubt that many of these terms will migrate into general usage via the proliferating home computers and computer networks. As human communication itself is transformed by the insidiously useful technology so will our language be. But you certainly don't have to believe that to enjoy this glimpse into the remarkable subculture of hackers, the computer code artists who live at the very edge of the informationally possible.*

*Presented here is about half of the Computer Jargon File (leaving out the most technical and more conventional terms) sent to us by long-time contributor Bud Spurgeon of Austin, Texas. He got it off the famed ARPANET that links all the more powerful computer centers. On time-T-minus-1 notice two computer types (Phil Wadler and Guy Steele) at Carnegie-Mellon University in Pittsburgh came up with self-images to match the words.*

*I asked Spurgeon, uh, who do we send the $200 payment for the piece to? Said he,*

*"This is an interesting question and no doubt one that will come up again and again as computer networks begin to get off the ground. Why don't you offer your payment to whomever can make the best case for ownership and see if by that method we could come up with some reasonable standard of ownership of network generated documents. (My argument would be that something this diffuse is in the public domain and that nobody pays. But how diffuse must it get before that happens? I don't know; does anyone?)"*

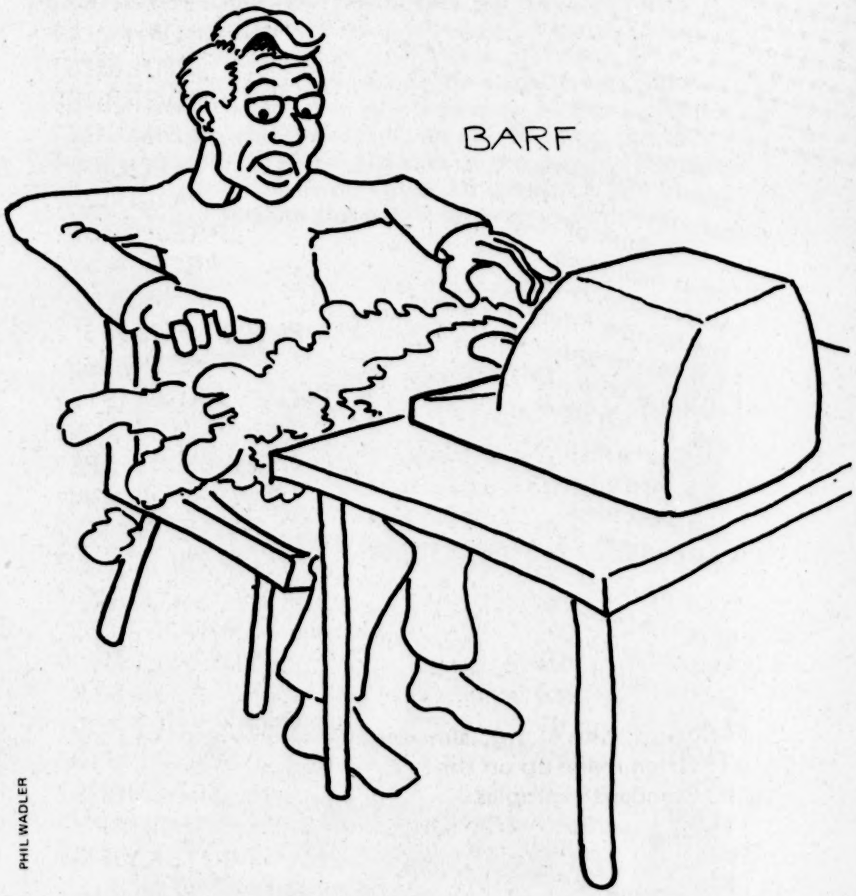
*—SB*

**ARG** *n.* Abbreviation for "argument" (to a function), used so often as to have become a new word.

**AUTOMAGICALLY** *adv.* Automatically, but in a way which, for some reason (typically because it is too complicated, or too ugly, or perhaps even too trivial), I don't feel like explaining to you. See MAGIC. Example: Some programs which produce XGP output files spool them automagically.

**BAGBITER** 1. *n.* Equipment of program that fails, usually intermittently. 2. BAGBITING: *adj.* Failing hardware or software. "This bagbiting system won't let me get out of spacewar." Usage: verges on obscenity. Grammatically separable; one may speak of "biting the bag." Synonyms: LOSER, LOSING, CRETINOUS, BLETCHEROUS, BARFUCIOUS, CHOMPER, CHOMPING.

**BARF** [from the "layman" slang, meaning "vomit"] 1. *interj.* Term of disgust. See BLETCH. 2. *v.* Choke, as on input. May mean to give an error message. "The function '=' compares two fixnums or two flonums, and barfs on anything else." 3. BARFULOUS, BARFUCIOUS: *adj.* Said of something which would make anyone barf, if only for aesthetic reasons.



PHIL WADLER

**BLETCH** [from German "brechen," to vomit (?)] 1. *interj.* Term of disgust. 2. BLETCHEROUS: *adj.* Disgusting in design or function. "This keyboard is bletcherous!" Usage: slightly comic.

**BOGOSITY** *n.* The degree to which something is BOGUS (q.v.). At CMU, bogosity is measured with a bogometer; typical use: in a seminar, when a speaker says something bogus, a listener might raise his hand and say, "My bogometer just triggered." The agreed-upon unit of bogosity is the microLenat (μL).

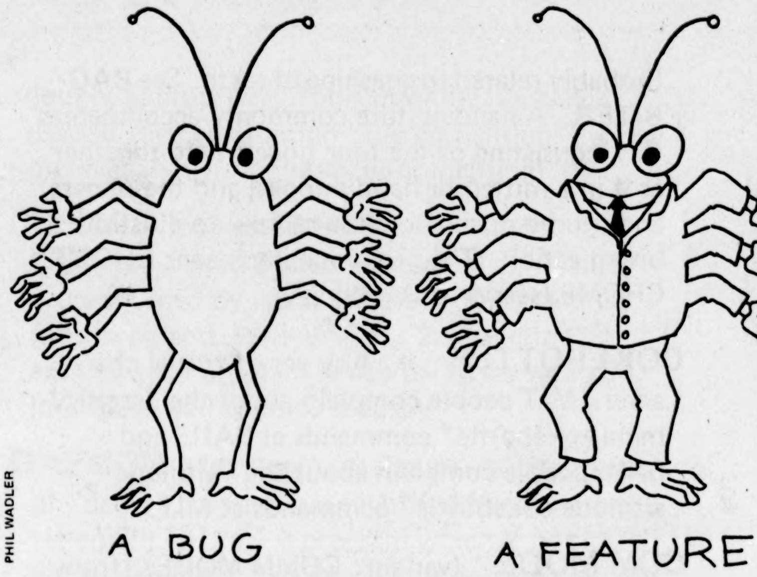
**BOGUS** (WPI, Yale, Stanford) *adj.* 1. Nonfunctional. "Your patches are bogus." 2. Useless. "OPCON is a bogus program." 3. False "Your arguments are bogus." 4. Incorrect. "That algorithm is bogus." 5. Silly. "Stop writing those bogus sagas." (This word seems to have some, but not all, of the connotations of RANDOM.)

**BRAIN-DAMAGED** [generalization of "Honeywell Brain Damage" (HBD), a theoretical disease invented to explain certain utter cretinisms in Multics] *adj.* Obviously wrong; cretinous; demented. There is an implication that the person responsible must have suffered brain damage, because he should have known better. Calling something brain-damaged is really bad; it also implies it is unusable.

**BROKEN** *adj.* 1. Not working properly (of programs). 2. Behaving strangely; especially (of people) exhibiting extreme depression.

**BUG** [from telephone terminology, "bugs in a telephone cable," blamed for noisy lines] *n.* An unwanted and unintended property of a program. See FEATURE.

**BUZZ** *v.* To run in a very tight loop, perhaps without guarantee of getting out.



PHIL WADLER

**CANONICAL** *adj.* The usual or standard state of something. A true story: One Bob Sjoberg, new at the MIT AI Lab, expressed some annoyance at the use of jargon. Over his loud objections, we made a point of using jargon as much as possible in his presence, and eventually it began to sink in. Finally, in one conversation, he used the word "canonical" in jargon-like fashion without thinking.

Steele: "Aha! We've finally got you talking jargon too!"
Stallman: "What did he say?"
Steele: "He just used 'canonical' in the canonical way."

**CATATONIA** (kat-uh-toe'-nee-uh) *n.* A condition of suspended animation in which the system is in a wedged (CATATONIC) state.

**CHOMP** *v.* To lose; to chew on something of which more was bitten off than one can.

# USAGE

**Verb doubling:** a standard construction is to double a verb and use it as a comment on what the implied subject does. Often used to terminate a conversation. Typical examples involve WIN, LOSE, HACK, FLAME, BARF, CHOMP:

"The disk heads just crashed." "Lose, lose."
"Mostly he just talked about his — crock. Flame, flame."
"Boy, what a bagbiter! Chomp, chomp!"

**Soundalike slang:** similar to Cockney rhyming slang. Often made up on the spur of the moment. Standard examples:

Boston Globe → Boston Glob
Herald American → Horrid (Harried) American
New York Times → New York Slime
Dime Time → Slime Time
Government property — do not duplicate (seen on keys) → government duplicity — do not propagate

Often the substitution will be made in such a way as to slip in a standard jargon word:

Dr. Dobb's Journal → Dr. Frob's Journal

**The -P Convention:** turning a word into a question by appending the syllable "P"; from the LISP convention of appending the letter "P" to denote a predicate (a Boolean-values function). The question should expect a yes/no answer, though it needn't. (See T and NIL.)

At dinnertime: "Foodp?" "Yeah, I'm pretty hungry." or "T!" "State-of-the-world-P?" (Straight) "I'm about to go home." (Humorous) "Yes, the world has a state."

**Peculiar nouns:** MIT AI hackers love to take various words and add the wrong endings to them to make nouns and verbs, often by extending a standard rule to nonuniform cases. Examples:

porous → porosity
generous → generosity
Ergo: mysterious → mysteriosity
ferrous → ferocity

Other examples: winnitude, disgustitude, hackification.

Probably related to gnashing of teeth. See BAGBITER. A hand gesture commonly accompanies this, consisting of the four fingers held together as if in a mitten or hand puppet, and the fingers and thumb open and close rapidly to illustrate a biting action. The gesture alone means CHOMP CHOMP (see Verb Doubling).

**COKEBOTTLE** *n.* Any very unusual character. MIT people complain about the "control-meta-cokebottle" commands at SAIL, and SAIL people complain about the "altmode-altmode-cokebottle" commands at MIT.

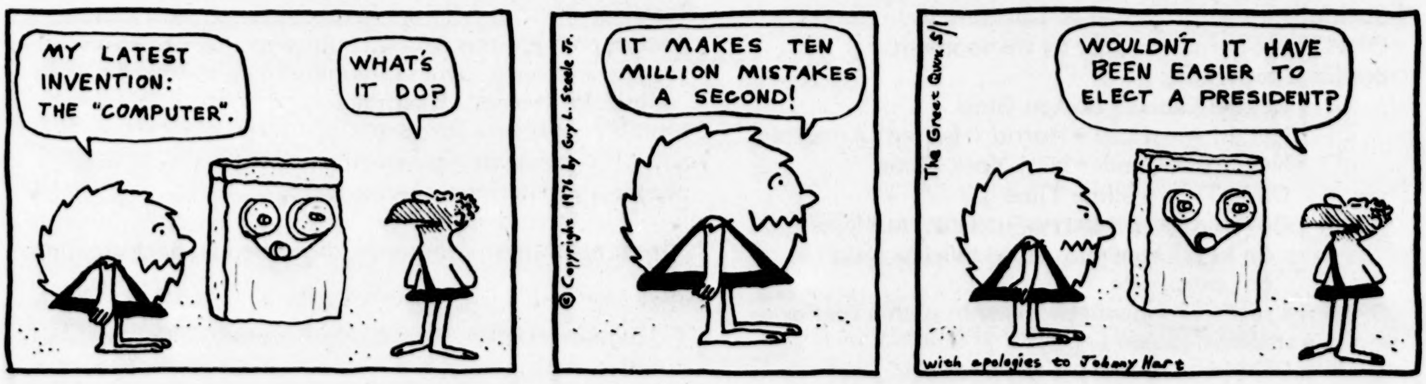
**COM MODE** (variant: COMM MODE) [from the ITS feature for linking two or more terminals together so that text typed on any is echoed on all, providing a means of conversation among hackers] *n.* The state a terminal is in when linked to another in this way. Com mode has a special set of Jargon words, used to save typing, which are not used orally:

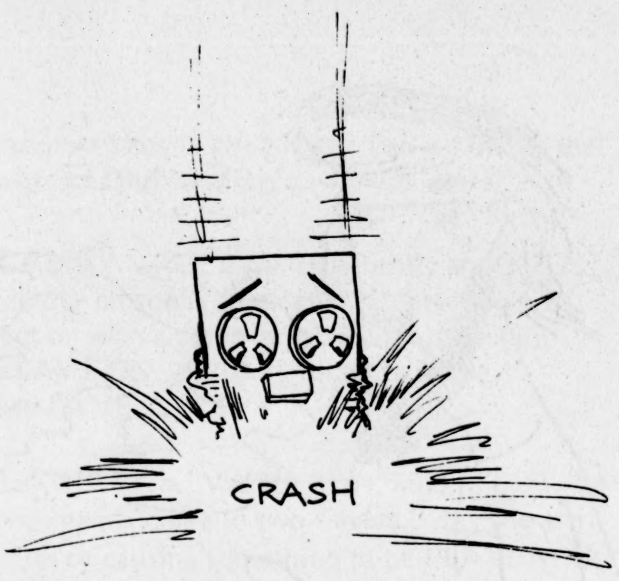
| | |
|---|---|
| BCNU | Be seeing you. |
| BTW | By the way . . . |
| BYE? | Are you ready to unlink? (This is the standard way to end a com mode conversation; the other person types BYE to confirm, or else continues the conversation.) |
| CUL | See you later. |
| FOO? | A greeting, also meaning R U THERE? Often used in the case of unexpected links, meaning also sorry if I butted in" (linker) or "What's up?" (linkee). |
| FYI | For your information . . . |
| GA | Go ahead (used when two people have tried to type simultaneously; this cedes the right to type to the other). |
| HELLOP | A greeting, also meaning R U THERE? (An instance of the "-P" convention.) |
| NIL | No (see the main entry for NIL). |
| OBTW | Oh, by the way . . . |
| R U THERE? | Are you there? |
| SEC | Wait a second (sometimes written SEC . . .). |
| T | Yes (see the main entry for T). |
| TNX | Thanks. |
| TNX $1.0E^{6}$ | Thanks a million (humorous). |
| (DOUBLE CRLF) | When the typing party has finished, he types two CRLF's to signal that he is done; this leaves a blank line between individual "speeches" in the conversation, making it easier to re-read the preceding text. |
| (NAME): | When three or more terminals are linked, each speech is preceded by the typist's login name and a colon (or a hyphen) to indicate who is typing. The login name often is shortened to a unique prefix (possibly a single letter) during a very long conversation. |

At Stanford, where the link feature is implemented by "talk loops," the term TALK MODE is used in place of COM MODE. Most of the above "sub-jargon" is used at both Stanford and MIT.

**CONNECTOR CONSPIRACY** [probably came into prominence with the appearance of the KL-10, none of whose connectors match anything else] *n.* The tendency of manufacturers (or, by extension, programmers or purveyors of anything) to come up with new products which don't fit together with the old stuff, thereby making you buy either all new stuff or expensive interface devices.

**CRASH** 1. *n.* A sudden, usually drastic failure. Most often said of the system (q.v., definition #1), sometimes of magnetic disk drives. "Three users lost their files in last night's disk crash." A disk crash which entails the read/write heads dropping onto the surface of the disks and scraping off the oxide may also be referred to as a "head crash." 2. *v.* To fail suddenly. "Has the system just crashed?" Also used transitively to indicate the cause of the crash (usually a person or a program, or both). "Those idiots playing spacewar crashed the system." Sometimes said of people. See GRONK OUT.


MY LATEST INVENTION: THE "COMPUTER".
WHAT'S IT DO?
© Copyright 1976 by Guy L. Steele Jr.
IT MAKES TEN MILLION MISTAKES A SECOND!
The Great Quux 5/1
WOULDN'T IT HAVE BEEN EASIER TO ELECT A PRESIDENT?
with apologies to Johnny Hart



PHIL WADLER

**CRETIN** 1. *n.* Congenital loser (q.v.). 2. CRETINOUS: *adj.* See BLETCHEROUS and BAGBITING. Usage: somewhat ad hominem.

**CROCK** [probably from "layman" slang, which in turn may be derived from "crock of shit"] *n.* An awkward feature or programming technique that ought to be made cleaner. Example: Using small integers to represent error codes without the program interpreting them to the user is a crock. Also, a technique that works acceptably but which is quite prone to failure if disturbed in the least, for example depending on the machine opcodes having particular bit patterns so that you can use instructions as data words too; a tightly woven, almost completely unmodifiable structure.

**CRUFTY** [from "cruddy"] *adj.* 1. Poorly built, possibly overly complex. "This is standard old crufty DEC software." Hence CRUFT, *n.* shoddy construction. 2. Unpleasant, especially to the touch, often with encrusted junk. Like spilled coffee smeared with peanut butter and catsup. Hence CRUFT, *n.* disgusting mess. 3. Generally unpleasant. CRUFTY or CRUFTIE *n.* A small crufty object (see FROB); often one which doesn't fit well into the scheme of things. "A LISP property list is a good place to store crufties (or, random cruft)." [Note: Does CRUFT have anything to do with the Crift Lab at Harvard? I don't know, though I was a Harvard student. –GLS]

**CRUNCH** *v.* To process, usually in a time-consuming or complicated way. Connotes an essentially trivial operation which is nonetheless painful to perform. The pain may be due to the triviality being imbedded in a loop from 1 to 1,000,000,000. "FORTRAN programs do mostly number crunching." 2. To reduce the size of a file by a complicated scheme that produces bit configurations completely unrelated to the original data, such as by a Huffman code. (The file ends up looking like a paper document would if somebody crunched the paper into a wad.) Since such compression usually takes more computations than simpler methods such as counting repeated characters (such as spaces) the term is doubly appropriate. (This meaning is usually used in the construction "file crunch(ing)" to distinguish it from "number crunch(ing)".)

**CUSPY** [from the DEC acronym CUSP, for Commonly Used System Program, i.e., a utility program used by many people] (WPI) *adj.* 1. (of a program) Well-written. 2. Functionally excellent. A program which performs well and interfaces well to users is cuspy.

**DAEMON** (day'mun, dee'mun) [archaic form of "demon," which has slightly different connotations (q.v.)] *n.* A program which is not invoked explicitly, but which lays dormant waiting for some condition(s) to occur. The idea is that the perpetrator of the condition need not be aware that a daemon is lurking (though often a program will commit an action only because it knows that it will implicitly invoke a daemon). For example, writing a file on the lpt spooler's directory will invoke the spooling daemon, which prints the file. The advantage is that programs which want (in this example) files printed need not compete for access to the lpt. They simply enter their implicit requests and let the daemon decide what to do with them. Daemons are usually spawned automatically by the system, and may either live forever or be regenerated at intervals. Usage: DAEMON and DEMON are often used interchangeably, but seem to have distinct connotations. DAEMON was introduced to computing by CTSS people (who pronounced it dee'mon) and used it to refer to what is now called a DRAGON or PHANTOM (q.v.). The meaning and pronunciation have drifted, and we think this glossary reflects current usage.

**DEADLOCK** *n.* A situation wherein two or more processes are unable to proceed because each is waiting for another to do something. A common example is a program communicating to a PTY or STY, which may find itself waiting for output from the PTY/STY before sending anything more to it, while the PTY/STY is similarly waiting for more input from the controlling program before outputting anything. (This particular flavor of deadlock is called "starvation." Another common flavor is "constipation," where each process is trying to send stuff to the other, but all buffers are full because nobody is reading anything.) See DEADLY EMBRACE.

**DEADLY EMBRACE** *n.* Same as DEADLOCK (q.v.), though usually used only when exactly two processes are involved. DEADLY EMBRACE is the more popular term in Europe; DEADLOCK in the United States.

**DEMENTED** *adj.* Yet another term of disgust used to describe a program. The connotation in this case is that the program works as designed, but the design is bad. For example, a program that generates large numbers of meaningless error messages implying it is on the point of imminent collapse.

**DO PROTOCOL** [from network protocol programming] *v.* To perform an interaction with somebody or something that follows a clearly defined procedure. For example, "Let's do protocol with the check" at a restaurant means to ask the waitress for the check, calculate the tip and everybody's share, generate change as necessary, and pay the bill.

**DOWN** 1. *adj.* Not working. "The up escalator is down." 2. TAKE DOWN, BRING DOWN: *v.* To deactivate, usually for repair work. See UP.

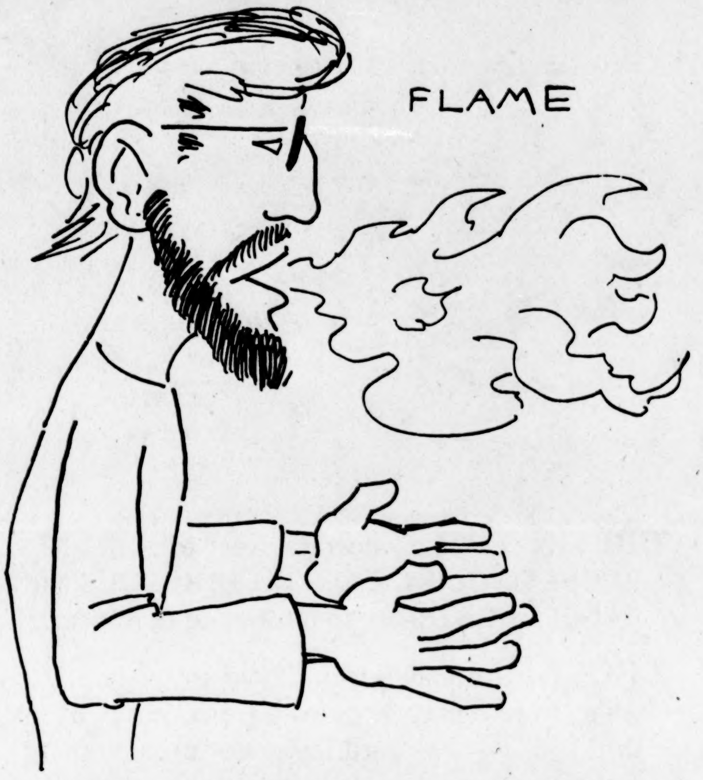
**DRAGON** *n.* (MIT) A program similar to a "daemon" (q.v.), except that it is not invoked at all, but is instead used by the system to perform various secondary tasks. A typical example would be an accounting program, which keeps track of who is logged in, accumulates load-average statistics, etc. At MIT, all free TVs display a list of people logged in, where they are, what they're running, etc. along with some random picture (such as a unicorn, Snoopy, or the Enterprise) which is generated by the "NAME DRAGON."

**EPSILON** [from standard mathematical notation for a small quantity] 1. *n.* A small quantity of anything. "The cost is epsilon." 2. *adj.* Very small, negligible; less than marginal. "We can get this feature for epsilon cost." 3. WITHIN EPSILON OF: Close enough to be indistinguishable for all practical purposes.

**EXCL** (eks'cul) *n.* Abbreviation for "exclamation point."

**FEATURE** *n.* 1. A surprising property of a program. Occasionally documented. To call a property a feature sometimes means the author of the program did not consider the particular case, and the program makes an unexpected, although not strictly speaking an incorrect response. See BUG. "That's not a bug, that's a feature!" A bug can be changed to a feature by documenting it. 2. A well-known and beloved property; a facility. Sometimes features are planned, but are called crocks by others. An approximately correct spectrum:

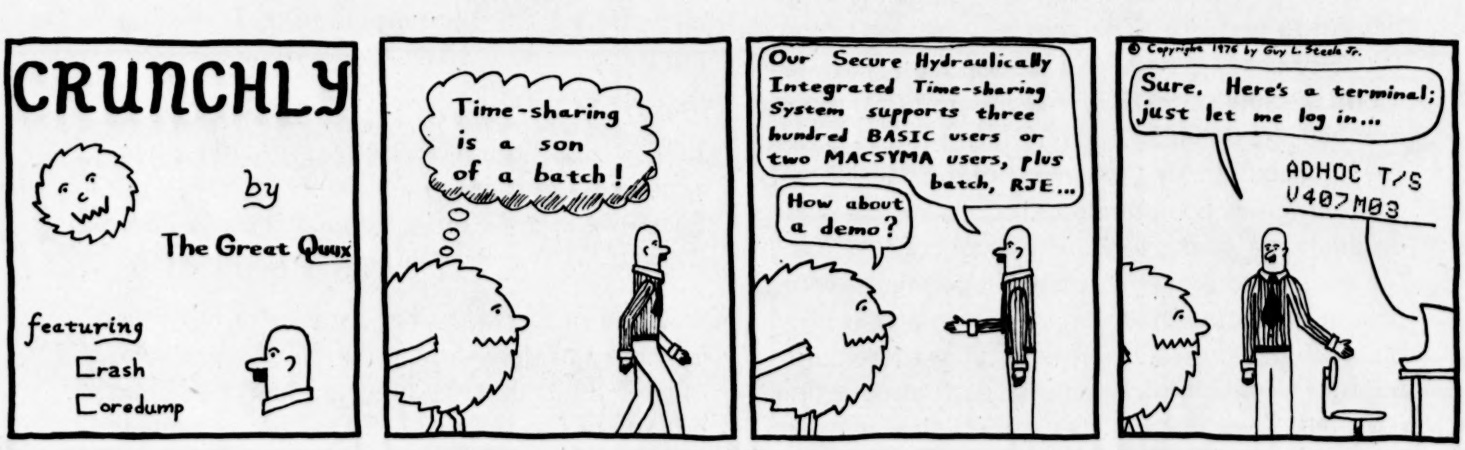
(These terms are all used to describe programs or portions thereof, except for the first two, which are included for completeness.) CRASH, STOPPAGE, BUG, SCREW, LOSS, MISFEATURE, CROCK, KLUGE, HACK, WIN, FEATURE, PERFECTION. (The last is never actually attained.)



PHIL WADLER

**FEEP** 1. *n.* The soft bell of a display terminal (except for a VT-52!); a beep. 2. *v.* To cause the display to make a feep sound. TTY's do not have feeps. Alternate forms: BEEP, BLEEP, or just about anything suitably onomatopoeic. The term BREEDLE is sometimes heard at SAIL, where the terminal bleepers are not particularly "soft" (they sound more like the musical equivalent of sticking out one's tongue). The "feeper" on a VT-52 has been compared to the sound of a '52 Chevy stripping its gears.

**FLAG DAY** [from a bit of Multics history involving a change in the ASCII character set originally scheduled for June 14, 1966] *n.* A software change which is neither forward nor backward compatible, and which is costly to


CRUNCHLY
by
The Great Quux
featuring
Crash
Coredump
Time-sharing is a son of a batch!
Our Secure Hydraulically Integrated Time-sharing System supports three hundred BASIC users or two MACSYMA users, plus batch, RJE...
How about a demo?
© Copyright 1976 by Guy L. Steele Jr.
Sure. Here's a terminal; just let me log in...
ADHOC T/S
V407M03

make and costly to revert. "Can we install that without causing a flag day for all users?"

**FLAME** *v.* To speak incessantly and/or rabidly on some relatively uninteresting subject or with a patently ridiculous attitude. FLAME ON: *v.* To continue to flame. See RAVE.

**FLAVOR** *n.* Variety, type, kind. "DDT commands come in two flavors." 2. The attribute of causing something to be FLAVORFUL. "This convention yields additional flavor by allowing one to . . ." See VANILLA.

**FLUSH** *v.* 1. To delete something, usually superfluous. "All that nonsense has been flushed." Standard ITS terminology for aborting an output operation. 2. To leave at the end of a day's work (as opposed to leaving for a meal). "I'm going to flush now." "Time to flush." 3. To exclude someone from an activity.

**FRIED** *adj.* 1. Non-working due to hardware failure; burnt out. 2. Of people, exhausted. Said particularly of those who continue to work in such a state. Often used as an explanation or excuse. "Yeah, I know that fix destroyed the file system, but I was fried when I put it in."

**FROBNICATE** *v.* To manipulate or adjust, to tweak. Derived from FROBNITZ. Usually abbreviated to FROB. Thus one has the saying "to frob a frob." See TWEAK and TWIDDLE. Usage: FROB, TWIDDLE, and TWEAK sometimes connote points along a continuum. FROB connotes aimless manipulation; TWIDDLE connotes gross manipulation, often a coarse search for a proper setting; TWEAK connotes fine-tuning. If someone is turning a knob on an oscilloscope, then if he's carefully adjusting it he is probably tweaking it; if he is just turning it but looking at the screen he is probably twiddling it; but if he's just doing it because turning the knob is fun, he's frobbing it.

**FROG** (variant: PHROG) 1. *interj.* Term of disgust (we seem to have a lot of them). 2. Used as a name for just about anything. 3. *n.* Of things, a crock. Of people, somewhere in between a turkey and a toad. 4. Jake Brown (FRG@SAIL). 5. FROGGY: *adj.* Similar to BAGBITING (q.v.), but milder. "This froggy program is taking forever to run!"

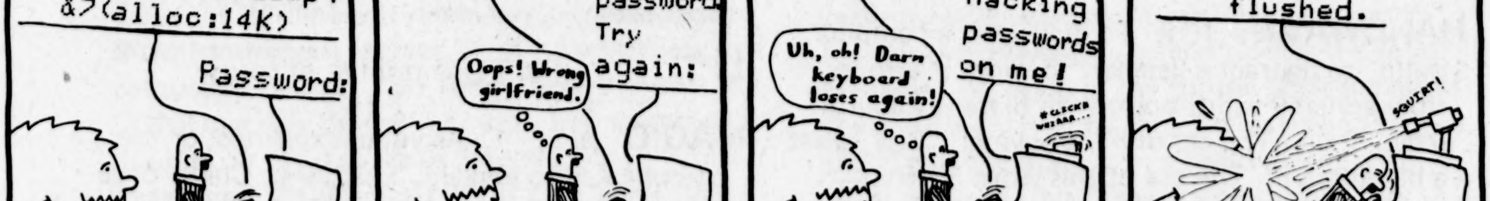
**GLITCH** [from the Yiddish "glitshen," to slide] 1. *n.* A sudden interruption in electric service, sanity, or program function. Sometimes recoverable. 2. *v.* (Stanford) To scroll a display screen.

**GLORK** 1. *interj.* Term of mild surprise, usually tinged with outrage, as when one attempts to save the results of two hours of editing and finds that the system has just crashed. 2. Used as a name for just about anything. See FOO. 3. *v.* Similar to GLITCH (q.v.), but usually used reflexively. "My program just glorked itself."

**GRONK** [popularized by the cartoon strip "B.C." by Johnny Hart, but the word apparently predates that] *v.* 1. To clear the state of a wedged device and restart it. More severe than "to frob" (q.v.). 2. To break. "The teletype scanner was gronked, so we took the system down." 3. GRONKED: *adj.* Of people, the condition of feeling very tired or sick. 4. GRONK OUT: *v.* To cease functioning. Of people, to go home and go to sleep. "I guess I'll gronk out now; see you all tomorrow."

**GROVEL** *v.* To work interminably and without apparent progress. Often used with "over." "The compiler grovelled over my code." Compare CRUNCH. Emphatic form: GROVEL OBSCENELY.

**HACK** *n.*, 1. Originally a quick job that produces what is needed, but not well. 2. The result of that job. 3. NEAT HACK: A clever technique. Also, a brilliant practical joke, where neatness is correlated with cleverness, harmlessness, and surprise value. Example: the Caltech Rose Bowl card display switch circa 1961. 4. REAL HACK: A crock (occasionally affectionate). *v.* 5. With "together," to throw something together so it will work. 6. To bear emotionally or physically. "I can't hack this heat!" 7. To


The Great Quux 3/17
login 314159,STAFF@2% \Crash Coredump\ &7(alloc:14K)
Password:
Molly
Oops! Wrong girlfriend.
Incorrect password. Try again:
Dorisss
Uh, oh! Darn keyboard loses again!
Foo! You are hacking passwords on me!
Login attempt flushed.
SQUIRT!

work on something (typically a program). In specific sense: "What are you doing?" "I'm hacking TECO." In general sense: "What do you do around here?" "I hack TECO." (The former is time-immediate, the latter time-extended.) More generally, "I hack x" is roughly equivalent to "x is my bag." "I hack solid-state physics." 8. To pull a prank on. See definition 3 and HACKER (def. #6). 9. *v.i.* To waste time (as opposed to TOOL). "Watcha up to?" "Oh, just hacking." 10. HACK UP (ON): To hack, but generally implies that the result is meanings 1-2. 11. HACK VALUE: Term used as the reason or motivation for expending effort toward a seemingly useless goal, the point being that the accomplished goal is a hack. For example, MacLISP has code to read and print roman numerals, which was installed purely for hack value. HAPPY HACKING: A farewell. HOW'S HACKING?: A friendly greeting among hackers. HACK HACK: A somewhat pointless but friendly comment, often used as a temporary farewell.

**HACKER** [originally, someone who makes furniture with an axe] *n.* 1. A person who enjoys learning the details of programming systems and how to stretch their capabilities, as opposed to most users who prefer to learn only the minimum necessary. 2. One who programs enthusiastically or who enjoys programming rather than just theorizing about programming. 3. A person capable of appreciating hack value (q.v.). 4. A person who is good at programming quickly. Not everything a hacker produces is a hack. 5. An expert at a particular program, or one who frequently does work using it or on it; example: "A SAIL hacker." (Definitions 1 to 5 are correlated, and people who fit them congregate.) 6. A malicious or inquisitive meddler who tries to discover information by poking around. Hence "password hacker," "network hacker."

**HACKISH** *adj.* Being or involving a hack. HACKISHNESS *n.*

**HAIR** *n.* The complications which make something hairy. "Decoding TECO commands requires a certain amount of hair." Often seen in the phrase INFINITE HAIR, which connotes extreme complexity.

**HANDWAVE** 1. *v.* To gloss over a complex point; to distract a listener; to support a (possibly actually valid) point with blatantly faulty logic. 2. *n.* The act of handwaving. "Boy, what a handwave!" The use of this word is often accompanied by gestures: both hands up, palms forward, swinging the hands in a vertical plane pivoting at the elbows and/or shoulders (depending on the magnitude of the handwave); alternatively, holding the forearms still while rotating the hands at the wrist to make them flutter. In context, the gestures alone can suffice as a remark.

PHIL WADLER

**HARDWARILY** *adv.* In a way pertaining to hardware. "The system is hardwarily unreliable." The adjective "hardwary" is NOT used. See SOFTWARILY.

**HUNGUS** (hung'-ghis) [perhaps related to current slang "humongous"; which one came first (if either) is unclear] *adj.* Large, unwieldy, usually unmanageable. "TCP is a hungus piece of code." "This is a hungus set of modifications."

**KLUGE** (kloodj) *alt.* KLUDGE [from the German "kluge," clever] *n.* 1. A Rube Goldberg device in hardware or software. 2. A clever programming trick intended to solve a particular nasty case in an efficient, if not clear, manner. Often used to repair bugs. Often verges on being a crock. 3. Something that works for the wrong reason. 4. *v.* To insert a kluge into a program. "I've kluged this routine to get around that weird bug, but there's probably a better way." Also KLUGE UP. 5. KLUGE AROUND: To avoid by inserting a kluge.

**LOGICAL** [from the technical term "logical device," wherein a physical device is referred to by an arbitrary name] *adj.* Understood to have a meaning not necessarily corresponding to reality. E.g., if a person who has long held a certain post (e.g., Les Earnest at SAIL) left and was replaced, the replacement would for a while be known as the "logical Les Earnest." The word VIRTUAL is also used. At SAIL, "logical" compass directions denote a coordinate system in which "logical north" is toward San Francisco, "logical west" is toward the ocean, etc., even though logical north varies between physical (true) north near S.F. and physical west near San Jose.

**LPT** (lip'-it) *n.* Line printer, of course.

**MAGIC** *adj.* 1. As yet unexplained, or too complicated to explain. (Arthur C. Clarke once said that magic was as-yet-not-understood science.) "TTY echoing is controlled by a large number of magic bits." "This routine magically computes the parity of an eight-bit byte in three instructions." 2. (Stanford) A feature not generally publicized which allows something otherwise impossible, or a feature formerly in that category but now unveiled. Example: The keyboard commands which override the screen-hiding features.

**MARGINAL** *adj.* 1. Extremely small. "A marginal increase in core can decrease GC time drastically." 2. Of extremely small merit. "This proposed new feature seems rather marginal to me." 3. Of extremely small probability of winning. "The power supply was rather marginal anyway; no wonder it crapped out." 4. MARGINALLY: *adv.* Slightly. "The ravs here are only marginally better than at Small Eating Place."

**MISFEATURE** *n.* A feature which eventually screws someone, possibly because it is not adequate for a new situation which has evolved. It is not the same as a bug because fixing it involves a gross philosophical change to the structure of the system involved. Often a former feature becomes a misfeature because a tradeoff was made whose parameters subsequently changed (possibly only in the judgment of the implementors). "Well, yeah, it's kind of a misfeature that file names are limited to six characters, but we're stuck with it for now."

**MOBY** [seems to have been in use among model railroad fans years ago. Entered the world of AI with the Fabritek 256K moby memory of MIT-AI. Derived from Melville's "Moby Dick" (some say from "Moby Pickle").] 1. *adj.* Large, immense, or complex. "A moby frob." 2. *n.* The maximum address space of a machine, hence 3. *n.* 256K words, the size of a PDP-10 moby. (The maximum address space means the maximum normally addressable space, as opposed to the amount of physical memory a machine can have. Thus the MIT PDP-10s each have two mobies, usually referred to as the "low moby" (0-777777) and "high moby" (1000000-1777777), or as "moby 0" and "moby 1." MIT-AI has four mobies of address space: moby 2 is the PDP-11 interface.) In this sense "moby" is often used as a generic unit of either address space (18. bits' worth) or of memory (about a megabyte, or 9/8 megabyte (if one accounts for difference between 32.- and 36.-bit words), or 5/4 megacharacters). 4. A title of address (never of third-person reference), usually used to show admiration, respect, and/or friendliness to a competent hacker. "So, moby Knight, how's the CONS machine doing?" 5. *adj.* In backgammon, doubles on the dice, as in "moby sixes," "moby ones," etc. MOBY FOO, MOBY WIN, MOBY LOSS: standard emphatic forms. FOBY MOO: a spoonerism due to Greenblatt.

**MODE** *n.* A general state, usually used with an adjective describing the state. "No time to hack; I'm in thesis mode." Usage: in its jargon sense, MODE is most often said of people, though it is sometimes applied to programs and inanimate objects. "If you're on a TTY, E will switch to non-display mode." In particular, see DAY MODE, NIGHT MODE (under PHASE), and YOYO MODE; also COM MODE.

**MODULO** *prep.* Except for. From mathematical terminology: one can consider saying that 4 = 22 "except for the 9's" (4 - 22 mod 9). "Well, LISP seems to work okay now, modulo that GC bug."

**MUMBLAGE** *n.* The topic of one's mumbling (see MUMBLE). "All that mumblage" is used like "all that stuff" when it is not quite clear what it is or how it works, or like "all that crap" when "mumble" is being used as an implicit replacement for obscenities.

**MUMBLE** *interj.* 1. Said when the correct response is either too complicated to enunciate or the speaker has not thought it out. Often prefaces a longer answer, or indicates a general reluctance to get into a big long discussion. "Well, mumble." 2. Sometimes used as an expression of disagreement. "I think we should buy it." "Mumble!" Common variant: MUMBLE FROTZ.

**N** *adj.* 1. Some large and indeterminate number of objects; "There were N bugs in that crock!"; also used in its original sense of a variable name. 2. An arbitrarily large (and perhaps infinite) number. 3. A variable whose value is specified by the current context. "We'd like to order N wonton soups and a family dinner for N-1." 4. NTH: *adj.* The ordinal counterpart of N. "Now for the Nth and last time . . ." In the specific context "Nth-year grad student," N is generally assumed to be at least 4, and is usually 5 or more. See also 69.

**OPEN** *n.* Abbreviation for "open (or left) parenthesis," used when necessary to eliminate oral ambiguity. To read aloud the LISP form (DEFUN FOO (X) (PLUS X 1)) one might say: "Open def-fun foo, open eks close, open, plus eks one, close close."

**PDL** (piddle or puddle) [acronym for Push Down List] *n.* 1. A LIFO queue (stack); more loosely, any priority queue; even more loosely, any queue. A person's pdl is the set of things he has to do in the future. One speaks of the next project to be attacked as having risen to the top of the pdl. "I'm afraid I've got real work to do, so this'll have to be pushed way down on my pdl." See PUSH and POP. 2. Dave Lebling (PDL@DM).

**PESSIMAL** [Latin-based antonym for "optimal"] *adj.* Maximally bad. "This is a pessimal situation."

**PHASE** (of people) 1. *n.* The phase of one's waking-sleeping schedule with respect to the standard 24-hour cycle. This is a useful concept among people who often work at night according to no fixed schedule. It is not uncommon to change one's phase by as much as six hours/day on a regular basis. "What's your phase?" "I've been getting in about 8 PM lately, but I'm going to work around to the day schedule by Friday." A person who is roughly 12 hours out of phase is sometimes said to be in "night mode." (The term "day mode" is also used, but less frequently.) 2. CHANGE PHASE THE HARD WAY: To stay awake for a very long time in order to get into a different phase. 3. CHANGE PHASE THE EASY WAY: To stay asleep etc.

**PHASE OF THE MOON** *n.* Used humorously as a random parameter on which something is said to depend. Sometimes implies unreliability of whatever is dependent, or that reliability seems to be dependent on conditions nobody has been able to determine. "This feature depends on having the channel open in mumble mode, having the foo switch set, and on the phase of the moon."

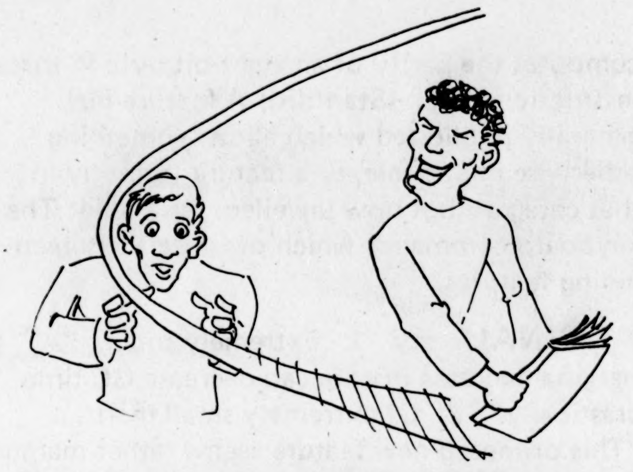
**POM** *n.* Phase of the moon (q.v.). Usage: usually used in the phrase "POM dependent" which means flaky (q.v.).

**RAPE** *v.* To (metaphorically) screw someone or something, violently. Usage: often used in describing file-system damage. "So-and-so was running a program that did absolute disk I/O and ended up raping the master directory."

**RAVE** (WPI) *v.* 1. To persist in discussing a specific subject. 2. To speak authoritatively on a subject about which one knows very little. 3. To complain to a person who is not in a position to correct the difficulty. 4. To purposely annoy another person verbally. 5. To evangelize. See FLAME. Also used to describe a less negative form of blather, such as friendly bullshitting.

**REAL USER** *n.* 1. A commercial user. One who is paying "real" money for his computer usage. 2. A non-hacker. Someone using the system for an explicit purpose (research project, course, etc.). See USER.

**REAL WORLD, THE** *n.* 1. In programming, those institutions at which programming may be used in the same sentence as FORTRAN, COBOL, RPG, IBM, etc. 2. To programmers, the location of non-programmers and activities not related to programming. 3. A universe in which the standard dress is shirt and tie and in which a person's working hours are defined as 9 to 5. 4. The location of the status quo. 5. Anywhere outside a university. "Poor fellow, he's left MIT and gone into the real world." Used pejoratively by those not in residence there. In conversation, talking of someone who has entered the real world is not unlike talking about a deceased person.



SNARF

**SACRED** *adj.* Reserved for the exclusive use of something (a metaphorical extension of the standard meaning). "Accumulator 7 is sacred to the UUO handler." Often means that anyone may look at the sacred object, but clobbering it will screw whatever it is sacred to.

**SNARF** *v.* To grab, esp. a large document or file for the purpose of using it either with or without the author's permission. See BLT. Variant: SNARF (IT) DOWN. (At MIT on ITS, DDT has a command called SNARF which grabs a job from another (inferior) DDT.)

**SOFTWARE ROT** *n.* Hypothetical disease the existence of which has been deduced from the observation that unused programs or features will stop working after sufficient time has passed, even if "nothing has changed." Also known as "bit decay."

**SPLAT** *n.* 1. Name used in many places (DEC, IBM, and others) for the ASCII star ("*") character. 3. (Stanford) Name used by some people for the Stanford/ITS extended ASCII circle-x character. (This character is also called "circle-x," "blobby," and "frob," among other names.) 4. (Stanford) Name for the semi-mythical extended ASCII circle-plus character. 5. Canonical name for an output routine that outputs whatever the local interpretation of splat is. Usage: nobody really agrees what character "splat" is, but the term is common.

**STATE** *n.* Condition, situation. "What's the state of NEWIO?" "It's winning away." "What's your state?" "I'm about to gronk out." As a special case, "What's the state of the world?" (or, more silly, "State-of-the-world-P?") means "What's new?" or "What's going on?"

**TASTE** *n.* (primarily MIT-DMS) The quality in programs which tends to be inversely proportional to the number of features, hacks, and kluges programmed into it. Also, TASTY, TASTEFUL, TASTEFULNESS. "This feature comes in N tasty flavors." Although TASTEFUL and FLAVORFUL are essentially synonyms, TASTE and FLAVOR are not.

**TECO** (tee'koe) [acronym for Text Editor and COrrector] 1. *n.* A text editor developed at MIT, and modified by just about everybody. If all the dialects are included, TECO might well be the single most prolific editor in use. Noted for its powerful pseudo-programming features and its incredibly hairy syntax. 2. *v.* To edit using the TECO editor in one of its infinite forms; sometimes used to mean "to edit" even when not using TECO! Usage: rare at SAIL, where most people wouldn't touch TECO with a TENEX pole. [Historical note: DEC grabbed an ancient version of MIT TECO many years ago when it was still a TTY-oriented editor. By now, TECO at MIT is highly display-oriented and is actually a language for writing editors, rather than an editor. Meanwhile, the outside world's various versions of TECO remain almost the same as the MIT version of ten years ago. DEC recently tried to discourage its use, but an underground movement of sorts kept it alive.] [Since this note was written I found out that DEC tried to force their hackers by administrative decision to use a hacked up and generally lobotomized version of SOS instead of TECO, and they revolted. –MRC]

**THEORY** *n.* Used in the general sense of idea, plan, story, or set of rules. "What's the theory on fixing this TECO loss?" "What's the theory on dinner tonight?" ("Chinatown, I guess.") "What's the current theory on letting losers on during the day?" "The theory behind this change is to fix the following well-known screw . . ."

**TIME T** *n.* 1. An unspecified but usually well-understood time, often used in conjunction with a later time T+1. "We'll meet on campus at time T or at Louie's at time T+1." 2. SINCE (OR AT) TIME T EQUALS MINUS INFINITY: A long time ago; for as long as anyone can remember; at the time that some particular frob was first designed.

**TWIDDLE** *n.* 1. tilde (ASCII 176, "~"). Also called "squiggle," "sqiggle" (sic — pronounced "skig'gul"), and "twaddle," but twiddle is by far the most common term. 2. A small and insignificant change to a program. Usually fixes one bug and generates several new ones. 3. *v.* To change something in a small way. Bits, for example, are often twiddled. Twiddling a switch or knob implies much less sense of purpose than toggling or tweaking it; see FROBNICATE.

**UP** *adj.* 1. Working, in order. "The down escalator is up." 2. BRING UP: *v.* To create a working version and start it. "They brought up a down system."

**VANILLA** *adj.* Ordinary flavor, standard. See FLAVOR. When used of food, very often does not mean that the food is flavored with vanilla extract! For example, "vanilla-flavored wonton soup" means ordinary wonton soup, as opposed to hot and sour wonton soup.

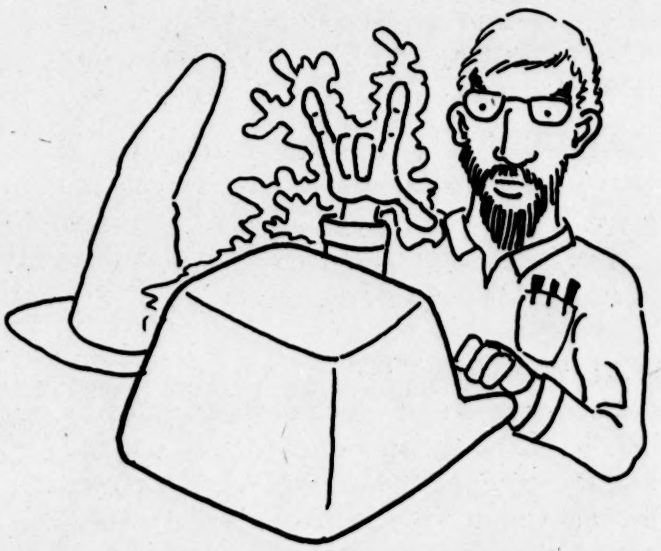
**WALL** [shortened from of HELLO WALL, apparently from the phrase "up against a blank wall"] (WPI) *interj.* 1. An indication of confusion, usually spoken with a quizzical tone. "Wall??" 2. A request for further explication.

**WEDGED** [from "head wedged up ass"] *adj.* To be in a locked state, incapable of proceeding without help. (See GRONK.) Often refers to humans suffering misconceptions. "The swapper is wedged." This term is sometimes used as a synonym for DEADLOCKED (q.v.).

**WIZARD** *n.* 1. A person who knows how a complex piece of software or hardware works; someone who can find and fix his bugs in an emergency. Rarely used at MIT, where HACKER is the preferred term. 2. A person who is permitted to do things forbidden to ordinary people, e.g., a "net wizard" on a TENEX may run programs which speak low-level host-imp protocol; an ADVENT wizard at SAIL may play Adventure during the day.

**YOYO MODE** *n.* State in which the system is said to be when it rapidly alternates several times between being up and being down.

**ZERO** *v.* 1. To set to zero. Usually said of small pieces of data, such as bits or words. 2. To erase; to discard all data from. Said of disks and directories, where "zeroing" need not involve actually writing zeroes throughout the area being zeroed. ■



WIZARD

PHIL WADLER

# The Quest for 'Freeorder'

### *An Interview with the Man Who Started the Denver Open Network*

**Several years ago Leif Smith started an information clearinghouse to help people connect with whatever they needed to grow and explore. He called it an open network because its structure was dependent on the questions people asked and its content reflected the information they put into the system while pursuing their individual quests. Using a computer, a monthly publication called *Network News*, get-togethers, and frequent telephoning, the open network has built up an impressive history of connections between people on the lookout for new ideas and skills. Working on a small scale, it has woven lives together in immensely educative patterns. This interview took place on May 7, 1980, at the offices of Network Research in Denver.**

**—Thomas James**

*This interview which appeared in the Fall 1980* ***Journal of Experiential Education*** *(Box 4625, Denver, CO 80204) was sent to us by Francisco Varela, a Chilean epistemologist of considerable subtlety and effect (his new* ***Principles of Biological Autonomy*** *is making waves that are making waves). Varela commented, "I guess I am so impressed with the Denver Open Network because it has worked for me. Through its tools I met two of the most influential people in my life over the past years, which resulted in some pieces of work that are among the best I have produced."*

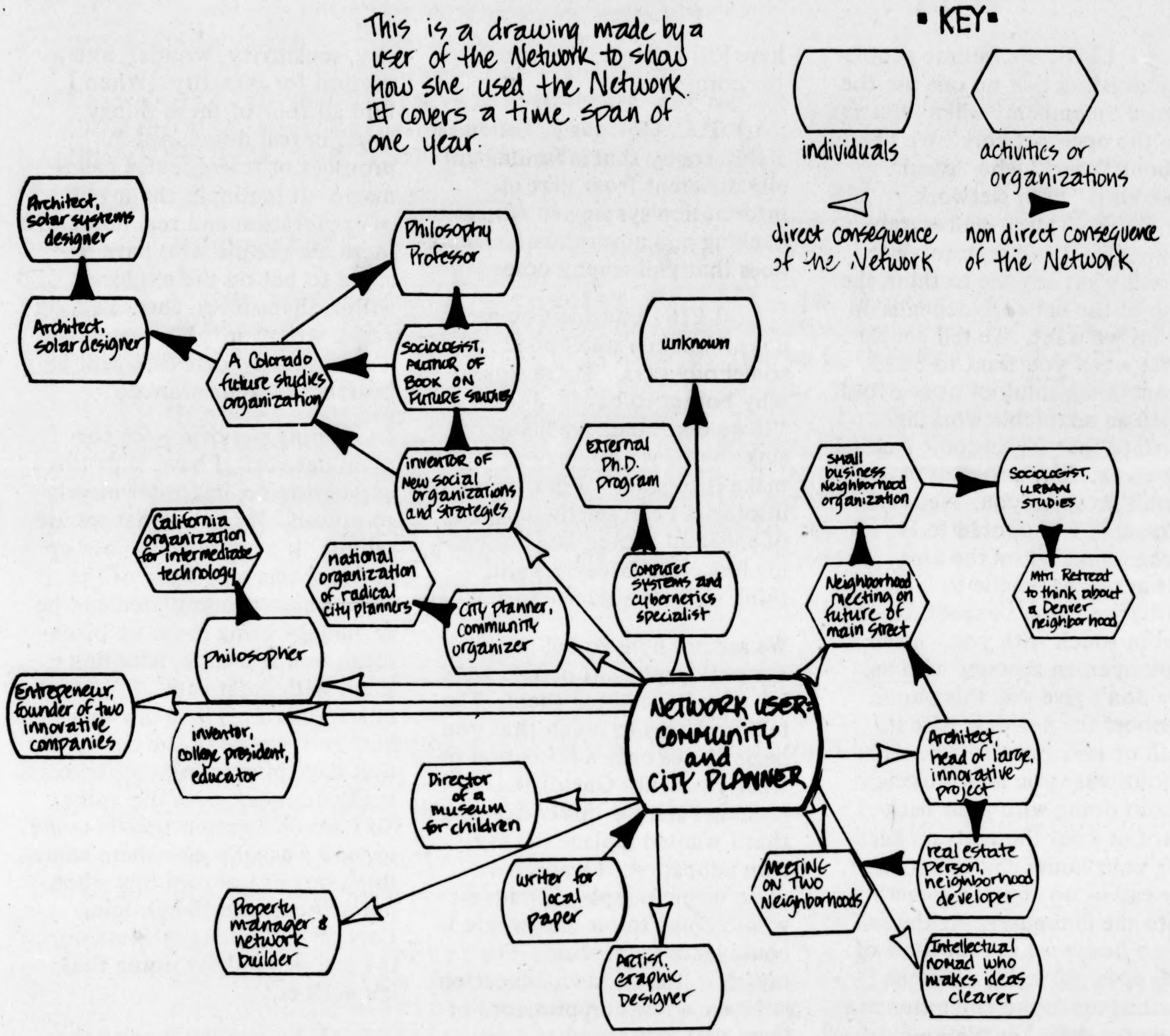
*Patricia Wagner, director of publications for Network Research, Inc., notes that she has been swamped with requests for free information about the Network and begs that people seeking information consider realistically the person and task on the other end of their request and enclose $2 at least. The address is Network Research, Inc., Box 18666, Denver, CO 80218.* *—SB*

**TOM JAMES**: What is a network?

**LEIF SMITH**: A network is an array of points connected by lines. If the points are people and the lines are things they are saying to each other or devices for carrying the things they are saying, then you have a network. Networks are nothing new. The newness is in running an office for a process we call "open network." I don't know of anyone ever having done that before.

**T.J.**: What makes a network open instead of closed?

**LEIF**: Let me read you something. It sounds serious, but I mean every word of it: "The open network is a freeorder arising from all aspects of the world in which an explorer of sovereign spirit may rejoice. It is a process and an image. It is not an organization. It cannot be owned and it cannot be controlled. You may connect with the open network through the facilities of Network Research in Denver. We find, invent, and distribute tools for explorers of all kinds – from scientists to artists to craftsmen to theologians." This office we operate here in Denver is not the open network. The open network is the process I defined as being comprised of all those aspects of the world in which an explorer of sovereign spirit may rejoice. This is such an open-ended definition that nobody could ever determine what it does and doesn't include – which is the reason I formulated it that way. If what is happening here is anything, it is an attempt to prove the value of tolerance, to create a way people can find each other and talk to each other without straining one another's capacity for patience. It is open to everybody, no matter how much they differ. The value hidden in people's differences, the potential arising from the fact that people don't see eye to eye about things, can be turned to advantage,


This is a drawing made by a user of the Network to show how she used the Network. It covers a time span of one year.

• KEY •
individuals
activities or organizations
direct consequence of the Network
non direct consequence of the Network
Architect, solar systems designer
Philosophy Professor
Architect, solar designer
A Colorado future studies organization
Sociologist, Author of Book on Future Studies
unknown
inventor of New social organizations and strategies
External Ph.D. Program
Small business Neighborhood organization
Sociologist, Urban Studies
California organization for intermediate technology
national organization of radical city planners
City planner, community organizer
Computer systems and cybernetics specialist
Neighborhood meeting on future of main street
Mtn Retreat to think about a Denver neighborhood
Philosopher
Entrepeneur, founder of two innovative companies
inventor, college president, educator
NETWORK USER: COMMUNITY and CITY PLANNER
Architect, head of large, innovative project
Director of a museum for children
real estate person, neighborhood developer
writer for local paper
MEETING ON TWO Neighborhoods
Property manager & network builder
Artist, Graphic Designer
Intellectual nomad who makes ideas clearer

especially by an organization that doesn't define in advance what it's for.

**T.J.**: What do you mean by "freeorder"? It seems as though you have constructed a paradox with those words.

**LEIF**: It may seem that the words indicate a paradox, but to me they express the highest of all harmonies. Proudhon, a French anarchist writer, said that order is the daughter of freedom, not the parent. The idea is that if you know when to abstain from controlling things you have the power to control, the result is a spontaneous order far richer than anything you could have contrived by foresight. This is especially true when you move beyond the domain of a single individual and look at what happens when people begin to interact. In constructing an open network, we have placed severe limits on ourselves so that we don't prevent that spontaneous order from taking place. One limit is that we do not allow ourselves to classify the data coming into the computer system of the open network. We have no preselected key words or categories; the entries are organized through a key word system, but the users of the network decide what words they want to connect to the things they put into the the computer.

**T.J.**: Do you censor any of the entries?

**LEIF**: Never have. If I became convinced that I was in the presence of outright malice or intent to harm, then things would stop. But I've never run into that here, and I don't expect to.

**T.J.**: You mentioned a computer system. You also said earlier that the open network is not an organization. Another paradox?

**LEIF**: The office where we work is an organization. But all the office does is to serve people who are involved in the process of the open network. The open network is a freeorder not controlled by the office, but supported by it in ways that make freedom possible. If I were to call the office anything, I would call it a network generator. The business of a good network generator is to understand when to stop, to know what to leave alone. We think about what to leave alone as well as what to do. There are many times we don't make connections even though we could. People don't always want more information. We're in the business of facilitating exploration, which often means thinking until you come up with a few pieces of information that could be important to individuals – then you call them or hope they call you.

**T.J.**: How does the office function? How do the computer system and staff work to make connections?

**LEIF**: We initiate people by insisting that no one use the word "members" when referring to the open network. We talk about "users" who "open accounts" with Network Reseach. This is deliberately impersonal and remote. We don't want anyone to think the use of the network depends on what we want. We tell people that when you want to build something, think of us as a tool with an adaptable working surface that can become a chisel or a saw. You program us; we don't program you. Network Research is supposed to be programmable by the user. We always want people to take the initiative. Don't expect us to get in touch with you. When you open an account with us, we don't give you this phone number for nothing. Use it. Call up and give us a scenario about what you are thinking about doing with your backyard or your thoughts on keeping your house energy efficient. Or call us up and put something into the computer. At the last open house we ran for users of the open network, a woman walked up to the computer and typed in the word "communities." She was looking for a community to live in. Up on the screen came an entry from another woman who was standing beside her, whose entry was a listing of houses that offered cooperative living arrangements in Denver. You never know what a person might need, which is why we have no preselected set of key words such as energy, education, books, etc.

**T.J.**: But aren't you controlling the media through which people are communicating?

**LEIF**: We control it more than we want to because of poverty. We don't have the resources to get a terminal unit out to the public. The terminal in the network office is on loan from the company we work with. I would like terminals in public places in Denver where people could walk up to them and type in favorite words and see what happens. People who have never used a computer before would be able to find the things they are interested in. Very simple. I would like to have less control over access to the computer.

**T.J.**: Obviously, you have a philosophy that is fundamentally different from that of information systems in education, banking and government. Where does that philosophy come from?

**LEIF**: Imagine you are in a typhoon in a small boat and somebody says, "We're sinking, why bother to bail?" I reply, "If we don't bail, we'll surely sink; but if we do, maybe we'll make it to land." I'm optimistic insofar as I can see the outlines of a distant shore. So, I'm bailing like crazy because I still think we have a chance to make it.

We are not here to tell people our philosophy. If people walk in and ask, we'll tell them. The telling shapes so much that you begin to see only a reflection of what you said. One of the reasons I started this office was that I wanted a place for my own education. I wanted a place where people with ideas would come to me and where I could learn from them. For myself – for my own education – I have a few compressions of ideas that express what I am trying to do. One is the notion of freeorder that we've been talking about. By freeorder I mean a balance between designed and spontaneous orders which is conducive to exploration. In that definition I make no speculations as to the nature of the balance. I'm proposing that it is worth attending to the balance between designed and spontaneous orders, within individuals, within societies, and within organizations – any structure of experience in which one might find oneself. Somewhere in the balance of designed and spontaneous orders there is a social order that is optimum for the explorer, one that does not constrain either by an excess of tradition, binding new conjecture and preventing its test, or by excess of structure impeding access to tools.

Another of my ideas is that if resonance is the end, then freeorder is the means. By resonance I mean an expectation of magic. By magic I mean a fusion of four things in real doing: intensity, sensitivity, wonder, and a passion for integrity. When I find all four of these things fused in real doing, not in prospect or retrospect, I call it magic. It is simply the magic of exploration and real doing. If there are people who have decided to bet on the explorer within themselves, then we have a tool store for their use – and it is less likely that they will be beaten by circumstances.

In running the office for the open network, I have kept this exposition on freeorder mostly to myself. It is not what we are selling. If a situation comes up and it seems like some of the ideas I have accumulated can be of value, I bring them up piecemeal, one at a time, handling them with great care. Like tools in a tool box. There are two hundred people in the network that have interesting tool boxes, really complex ones like mine. So I am one person people come to, and I usually give them something out of my tool box, then point them to other people. Lots of tool exchange goes on. If I can be paid for doing that, it's perfect.

**T.J.**: Are there any other networks like this in the United States?

**LEIF**: Everyone has personal networks. Hundreds of millions of networks for all of us. Then there are networks more specifically established as networks – a society for professional engineers, for example. Thousands of those. Every journal creates a network of its own. A business, its clients and its salesmen that offer products constitute a network. Most networks that we know about are what I call focused networks: there is a world view that governs them, such as the network of professional engineers in Denver, the network of people interested in west coast Indian art – it goes on and on, all the definably different ways a network can be focused. The open network is perhaps a first. I've never seen anything like it, where a deliberate attempt was made to avoid all focus. Not because we think focus is bad, but because we think there is something else that needs to be

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3  Onyx Cave Park

   Keywords: APPROPRIATE AQUAFARMING ARKANSAS BARTER DWELLING
   GREENHOUSE HABITAT HOME HOUSE SCRIPT SOLAR SYSTEM TECHNOLOGY
   UNDERGROUND: [E# 530: Originator: Muriel H. Schmidt]

     3.1  Appropriate Development, Rural Arkansas

          I own and operate a tourist facility in Eureka Springs,
          Arkansas, hosting 100,000 paying guests a year. We have a few
          whitefaced herfords, lilliputian horses, a small orchard, a
          few pastures, two deep (1,000') wells, some acreage on U.S.
          Highway 62 and some on a private road, 1 small tractor, a
          medium and a D6 dozer, two tool areas, and a pottery factory.
          We are ready to do a mini-mall with underground dwelling and
          solar greenhouse. We want to begin aquafarming, and to set up
          a script-barter system. Can you help us with information and
          contacts in this and other similar areas? [Date Created: 18
          OCT 1979]. Contact: Muriel H. Schmidt, Onyx Cave Park, Rt 1,
          Box 788, Eureka Springs, AR 72632: 501-253-9321.

4  Solar Reactor

   Keywords: ENERGY INDEPENDENT MACHINE ANTI NUCLEAR TECHNOLOGY
   ALTERNATIVE APPROPRIATE ELECTRICAL ELECTRIC ELECTRICITY PARABOLIC
   COLLECTOR: [E# 752: Originator: David Kingsley]

     4.1  3.5 Kw Backyard Solar Power Plant

          Have solar/electric conversion plant in advanced design stage.
          Need help from finance, marketing and engineering people to
          develop feasable business plan. Stock in company available to
          committed individuals. [Date Created: 20 MAY 1980]. Contact:
          David Kingsley, 8797 W. 67th Way, Arvada, CO 80004: h:
          425-7457.
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**Open Network item from printout**

*"The gods send thread for the web begun," goes the old adage. What would you encounter if you pursued a quest through the open network? The brief history of the process is full of surprise and spontaneous connection. The city of Northglenn devised a plan for a self-sufficient waste recycling system through contacts made in the open network. According to a newspaper account, the recycling system shredded grass clippings and leaves into usable methane and a sludge that was fed to earthworms, which were then processed to make a protein supplement. Other connections included a local restaurant looking for people to design its interiors, a conference called "Windmills Are Tougher Than They Look," the beliefs of a man running for political office, information on roofing construction, a solar bookstore, a typewriter repair business for sale, a pantomime duo looking for engagements, and many more – a barter network, a conciliation service to avoid litigation, a holistic health network, a neighborhood organization that monitors government action and disseminates information to citizens.*

*"The card shark says 'read 'em and weep,' the farmer says 'weed 'em and reap,'" said one of the entries in* Network News. *Leif, who worked for a time as "philosophical consultant" to the Denver Free University, sees the interrelatedness he has created as a means for his own education as well as that of others: "My principle is never to do anything if you can find someone else to do it better, except for the things you want to do most of all." But he has added a twist of exploration to that statement, making it a call for learning and self-reliance. So the weaving of lives proceeds effortlessly without prescription – neighborhood gardens and community parks, the design of a left-handed pen molded to the natural contours of the hand, venture capitalists looking for interesting investments, someone hoping to find a music teacher, another wishing companionship to explore the visual presentation of mathematical forms in nature, a notice by a kite store on legal restrictions to kite flying, a guide to vegetarian food stores and restaurants, places open in a theater company, classes on how to get published, a quarterly magazine reviewing new books in the field of law, someone looking for allies to save the historic Elkhorn Lodge in Estes Park – and on and on, this thing that exists for no other purpose than to facilitate anybody's quest.* —T.J.

done. People are like artists in their explorations, but instead of a palette with colors of paint they have a palette of focused networks. Give them an open network and the palette increases manyfold. Successful connections through the open network number in the thousands. They are the sort that happen in a matter of thirty seconds and are gone. We never hear any more about them. We did our job and that's that.

Some people get wrapped up in a new network of their own. I tell them: If you ever have any ideas that seem strange and interesting, you have our number, For example, they get this idea to use a computer to keep track of who has what western art in what galleries in Denver. They think, "Who knows about art in Denver? Who can I talk to?" They ask one of their companions. No one can help. If that's what happens, they call the network and we will find someone that they can talk to. The network is also for the person who calls up and says, "I'm a user of the network and wondered if there was a person in the network who knows a lot about western art. I have a computer and I want to do such and such." There is a minimal context created – minimal because we don't lead people to suppose that just because someone is a user of the network, they are people you will want to talk to and be friends with. In fact, there are people in this open network who do not like each other at all.

**T.J.**: Could you give me an example?

**LEIF**: There are environmentalists in Colorado who put things into the computer as users of the open network. They discover that another user is someone they regard as being close in moral stature to Attila the Hun. He is one of the world's leading advocates of nuclear energy. This horrifies them. They come in thinking, "What a fantastic idea, an open network – anybody can use it." I show them the book this man has written. They look stunned. "He's in the network?" But it's an <u>open</u> network, right? The same thing happens on the other side – in the camp of the nuclear advocates. They get interested in the network. Then I tell them that one of the principal organizers of antinuclear demonstrations is a user of the network. We are here as a general purpose tool for explorers.

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7  Skills Bank Project

   Keywords: BARTER COMMUNITY DECENTRALIZATION TRADE WORK NETWORK; [E#
   302; Originator: Hugh Gardner]

   7.1   Neighborhood Skills Bank

         Seeking to create a computerized skills bank system for use by
         small neighborhood associations or groups of such
         associations. Particularly interested in locating
         entrepreneurial type with access to terminal open to
         developing such a service for small affordable fees on
         something like a syndicated basis, such that the operator
         could make some decent change at little cost to each group
         while working from a central phone number accessible to all.
         Basis of service neighbor-to-neighbor barter to save each
         participant money, to encourage local trade and face-to-face
         relationships, and draw anonymous communities closer together.
         Ultimate object: to up the level of vitality and integrity in
         urban neighborhoods and transform the political system to a
         true decentralized, participatory democracy. [Date Created: 07
         DEC 1978]. Contact: Hugh Gardner, Foundation for Urban and
         Neighborhood Development, 2653 W. 32, Denver, CO 80211;
         433-7163.

8  Alternatives to Large Dams

   Keywords: BEAVER CONSERVATION WATER WATERSHED ECOLOGY WILDERNESS
   ENGINEER OREGON CONSERVATIONIST; [E# 742; Originator: Kernel Jim
   Roaf]

   8.1   Beaver Dams

          Before the beaver were reduced to the status of a "menace" and
          systematically destroyed, they were our best watershed
          conservationists. Anyone interested in such natural
          alternatives to big dam projects should get in touch with us.
          [Date Created: 12 MAY 1980]. Contact: Kernel Jim Roaf, The
          Beaver Corps of Engineers, Rt. 1, Box 34A, Days Creek, OR
          97429.
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**Open Network item from printout**

A great many people on both sides are honest people trying to do their very best to see the planet as a good place to live. I'm convinced that both sides of that dispute have a lot to teach each other, and there are very few meeting grounds. If the open network can be one of them and if through that encounter, some people's appreciation for differences can increase a little, we may gain a lot.

**T.J.**: Would you say a little more about how the open network operates? Besides telephone conversations, open houses and people walking into the office, how do you communicate systematically with the users?

**LEIF**: We used to run a newspaper with two kinds of spaces, called network research space and user space. It was modeled on the idea of public and private spaces. The main content was in the private or user spaces. Our circulation was not large enough to support that idea, so we have designed a simpler monthly publication. We also will do an annual report for the year, where the main content will be spaces that the users of the network buy and put into it. For example, I have a philosophical venture and I'm a user of the network. I'm a weaver having something called Mountain Forge, which is a philosophical venture, a focused network. My entry says I'm buying a page in the network annual report and I'm inviting people whose ideas I especially like to sublet or take a grant of space from me where they can talk about what they are doing. The business of Mountain Forge will be to create the context that defines that entire space.

**T.J.**: What do you mean by the term "weaver"?

**LEIF**: Part of the architecture of this network we are propagating is that the main networkers will not be the staff of Network Research. When you think of a question, you call the open network as just one of the many things you do. A more intense form of network as just one of the many things you do. A more intense form of network, or "quest-facilitation," is not happening in this network but is being done by people I call weavers. For example, one might be a person who works for an underwriting firm bringing new companies to the public. Somebody else might be a career consultant. These are focused networks that use the open network as a place to find people and ideas.

**T.J.**: Does the Association of Experiential Education fit in as another network of that kind?

**LEIF**: Yes, it does. What we are trying to do is to design and implement a good working relationship between the office for open network and a tremendous variety of focused networks like AEE, all inhabited by at least one weaver. Maria Snyder has been a weaver for AEE. Weavers are the people who make connections in a network. We are trying to design tools principally for weavers. Five years from now, most of the users of the office for open network will probably be weavers who are using it as a device for enriching what people can find when they come in contact with their particular focused networks. Also, weavers pass people back and forth. Maria Snyder finds somebody who needs some other focused network, possibly through this office, so she passes on information.

We want to make sure that any explorer can quickly change the array of focused networks they use, so that they don't get stuck. I hope people always remember there is a phone number to call when they are seeking a change of network. Nobody is trapped. We live in a complex web of possibilities where there are no tightropes to fall off of. It's possible to think you are on a tightrope, but you learn to act differently than when you know you are in a sustaining web.

**T.J.**: A minute ago you used the term "architecture" when speaking of the open network.

**LEIF**: Network architecture pertains to the discussion on weavers. It is the relationship that exists between the powerless office for open network and the thousands of well focused, very well organized weavers that surround us. That relationship is central to the architecture of the system that serves open network. There is no end either to existing networks or to the new focused networks that can be created. In fact, the creation of new networks is another purpose of the open network. Frequently people will get ideas for patterns of interrelationships between themselves and others for which there is no supporting network.

For example, someone wants to build an integral urban house – a living unit designed to supply all of its own energy and food from within. As far as I know there is no network in Denver to serve this quest. There is beginning to be one, and much of the reason for it is that the people who are working on ideas having to do with integral urban houses are constantly in touch with the open network. So when we find somebody that might fit in, we pass the information on, and communication begins to occur. Gradually there is a merging of this focused network, with the intent of building an integral urban house in Denver as a demonstration and research project. That requires a good weaver.

**T.J.**: How many users are there now in the open network?

**LEIF**: In the history of the network we have had 771 accounts. Of those, approximately 600 are still active. The density of users is highest in Denver, but I think the right scale for an office for open network is regional. It should be metropolitan and spread for a few hundred miles. I do not see this office generating a nationwide or worldwide business, although we presently have users in 30 states and 7 countries.

**T.J.**: In what way do you see the open network as a business?

**LEIF**: I think of this office as a business with the highest aesthetic aspirations. I do not find those notions opposed to one another. All business means is that you tell people, "We have something that might be of value to you. If you can somehow support it to the extent that we can continue, we will provide it to you." The idea of business is that everybody gains. I'd love to make a profit here. The economics of this place will begin to make sense when we have 2000 to 2500 accounts. Right now it makes no sense at all. An economist would say I was subsidizing this place. I am willing to do that because, in my opinion, what I get from it now outweighs all the money I could presumably find a way to earn by doing something else. I'd rather be doing this, and I think the economics will work out as more people catch on to the value of the open network as a tool for exploration.

**T.J.**: How can people who read this journal get in touch with the network and find out more about it, or offer their services?

**LEIF**: First, they can give us a call. The number is (303) 832-9764. Second, if they would like information we will send out an information package. You can write to us at Network Research, P.O. Box 18666, Denver, CO 80218. We have not kept anyone from using the network because of lack of money, and we don't intend to start. Our access fee is going up like everything else, but we make it plain that we do not want to discriminate against people because they are poor. Right now the access fee is $30 per year.

**T.J.**: What do you think the future holds for the open network?

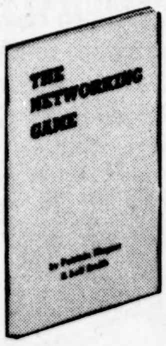
**LEIF**: I see the staff of open network as apprentice weavers, because this is not the place, in the long run, where you need a high-powered weaver. It is a lot simpler than that. As more and more people learn to use this system we are creating, it will be less and less necessary for the magic combinations to happen out of this office. I expect this will be a training ground for weavers who are developing focused networks in their own businesses, non-profit organizations, social service agencies, and the like.

The office of open network is one project of Network Research. We are going to have many other projects. Network Research is all about inventing, finding and distributing tools that explorers need to make proper habitats for themselves. What I am concentrating on now is the computer terminal as a tool, mostly to facilitate the work of weavers, but also to be useful to anyone who wanders in from the street, anyone yearning to be an explorer. ■

## The Networking Game

*By Patricia Wagner and Leif Smith, this booklet is a succinct introduction to wise networking, with or without computer gear.*
*—SB*

**The Networking Game**
Patricia Wagner
and Leif Smith
**$2** postpaid from:
Network Research
Box 18666
Denver, CO 80218



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Rule Number Two: Don't be Boring

A serious occupational hazard for people who want to network information is that of becoming boring. In the Networking Game, articulate people can show off their speaking abilities, and people with good memories can show off their mental lists of phone numbers. But, again, we must come back to the balancing point — are they being useful?

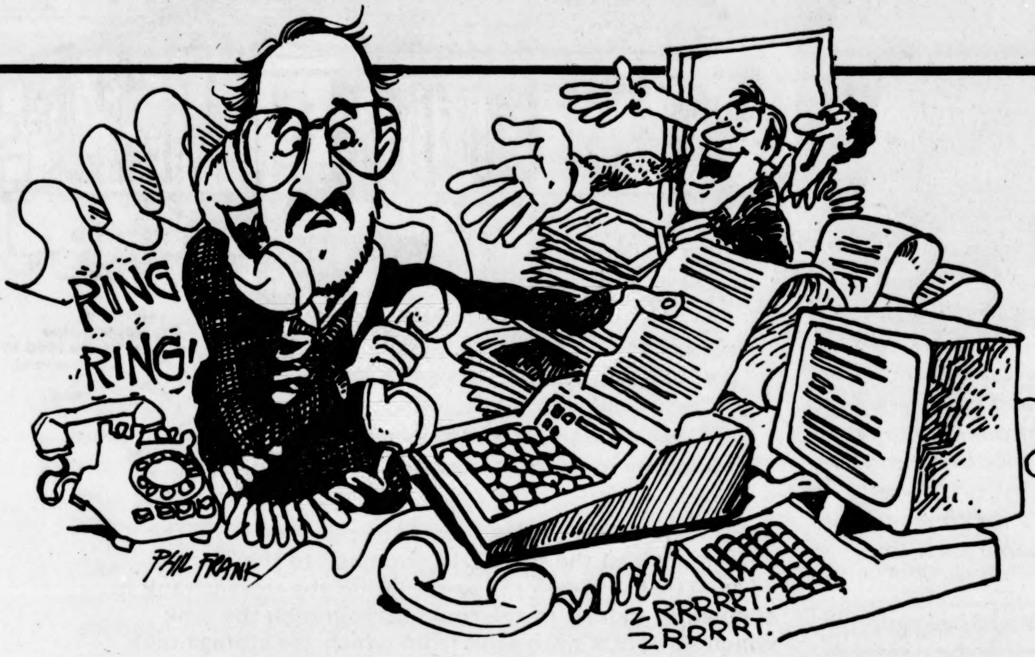
We have noticed, in the course of managing our own networking office, that three contacts are often more useful than thirty. The quality of the information is the most important factor, always. If you are not sure that the contacts you have mentioned are going to be useful, you might add a couple of extra names if you think they might lead somewhere. But try to avoid drowning the person you are supposed to help.

# Who took the Work out of Network?

### *by Art Kleiner*

NETWORKING scares me, because I like it too much. There's no factual basis for my fear. Without question, judging from firsthand reports by people who use them, the Denver Open Network and other computer-aided community information networks around the country are immensely valuable. (There are some starting in Portland, Oregon, Washington, D.C., Santa Barbara, California, and doubtlessly other cities I haven't heard about.) I had hoped to articulate my own fears by finding stories of other people who felt ripped off or hurt by such networks, but I haven't yet found a user who wasn't enthusiastic about them.

The small amount of networking I've done has informally resulted from articles I've published in **CQ** and other magazines. After writing about and using computer networks for about six months, I suddenly found myself referring people to other people on a three-times-a-week basis. The pace accelerated when I joined the research staff of the **Whole Earth Catalog**. Some typical examples: Last week a lower-echelon programmer in a large corporation called to ask if I knew of any computer-oriented jobs that didn't contradict her ecological, small-scale ideals. This week I was asked if I knew any cable TV companies that were producing their own programs. It seems anyone doing independent work



fields a similar number of requests. Anyone in the public eye is beseiged by them.

Typically, I'm thrilled by every contact. I love meeting new people, and like renewing earlier acquaintances. It's not uncommon to get a bit high on all the fast contact and flattery and logistic puzzle solving involved in finding the answers. Most often, the people I network with are more useful to me than I am to them; the man who asked about cable TV, for instance, had two months earlier given me some terrific leads for an article I was writing. So why do I get a sickly feeling in my stomach at the end of a meeting or phone call, as if I'd swallowed too much cotton candy?

The sickly feeling gets worse when I run across people who exploit networking. One computer network entrepreneur has fueled his enterprise by bullying and cajoling the others in his network into giving him dozens of hours of free labor. He holds out the carrot of mutual profit somewhere down the road, and uses the persistent force of his own desperation: "If we want this project to work, don't you see how you have to help me?" Another acquaintance gathered a few back issues of new age magazines, put them in bookracks in his living room, called it an Institute, and used it as a pretext to social climb among Bay Area scientists and counterculture figures, calling them for general information without looking any of his questions up in a book first.

Stewart Brand suggested this kind of glad-handing is probably just a phase some people go through when they start networking, the period when they're insufferable to their friends. That may be true, but it doesn't prevent them, en masse, from becoming a huge energy drain to the people they contact. And I can't help thinking that if it weren't for the legitimacy people give "networkers," these exploiters might be doing something useful instead.

At root, the best and most important work seems to be that which is done alone in solemn concentration. I suspect that kind of concentration can't coexist easily with the open accessibility of the networker. At root, the most soul-satisfying human contact seems to be the deep kind between people who have lived or worked together or been friends for years. I suspect no human can maintain more than a handful of such friendships (and a limited number of acquaintanceships above that) without seeing them all dissipate away.

With customary communication — phone, mail and even a limited computer network — the conflict seems to be manageable. People are sufficiently difficult to reach so that the flow never gets out of hand. With a computer based data bank in which we could find each other by our indexed keywords, it's easy to imagine the flow becoming an unstoppable torrent. We'd need to develop methods of screening the inquiries before we get them. Yet in open networks, which don't have any kind of corporate heirarchy or professional barriers (not that we'd want either), there's no way to screen anyone out until we've heard them out. You just don't know who's going to be interesting until after you've listened to them.

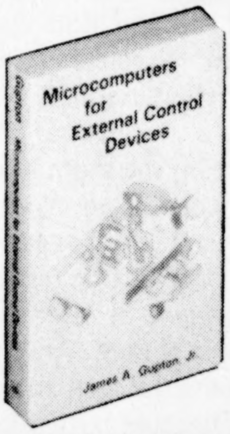
All conjecture. Yet in my own life I find that the more contacts I make, and meetings I go to, and fascinating inquiries and references and conversations I take part in, the more remote my "real work" — in my case writing, but it could as easily be design or scientific research or programming or invention or farming — becomes. And it requires a mental wrench to go back to it because networking is such a gleeful process by comparison. Perhaps it's just my own personality — "only a problem for people who can't say 'no'," as Nancy Dunn said — but I see the same process in many of my, . . . er, acquaintances. The only ones who seem to stay clear and actually get some work done are the ones who limit the networking in their life to none or almost none.

And I don't want to stop. It's been hard to write this because I'm afraid of alienating some of the people I network with and making them think I don't want to stay in touch. That's a horrible thought, like going off a drug addiction. If I moved to Denver, I'm sure I'd waste no time signing up. And I certainly depend on the networks I use now. So, please don't stop getting in touch with me. I'm sure there's somebody else I can introduce you to . . . . ■

## Microcomputers for External Control Devices

*The word automation conjures up images of Charlie Chaplin caught in a frenzied web of machinery, but it can also mean a household computer quietly keeping a thermostat, a fireplace flue, and a solar-powered water heater in synch. Such home energy-conserving systems are becoming more common as computerists experiment. Given some electronic skill, or patience and willingness to tinker, you can use this manual and a personal computer to do the same. Or you can put a small robot into motion, or establish a small-scale automatic factory, or (if you want to get compulsive) wire up your TV set so it switches channels automatically and rotates the aerial each time for the best reception.*

*Judging by the wealth of technical detail and imagination in this book, author James Grupton seems to be a veteran of such experiments. But he can also write clearly, even when explaining arcane devices like analog-digital converters (necessary for the computer to link to thermometers or light sensors). J. Baldwin, scanning the chapters on home energy control and computerizing solar, said they looked "interesting, even sinister."* —*Art Kleiner*



**Microcomputers for External Control Devices**
James A. Gupton, Jr.
1980; 279 pp.

**$15.95** postpaid from:
Dilithium Press
30 Northwest 23rd Place
Portland, OR 97210
or Whole Earth
Household Store

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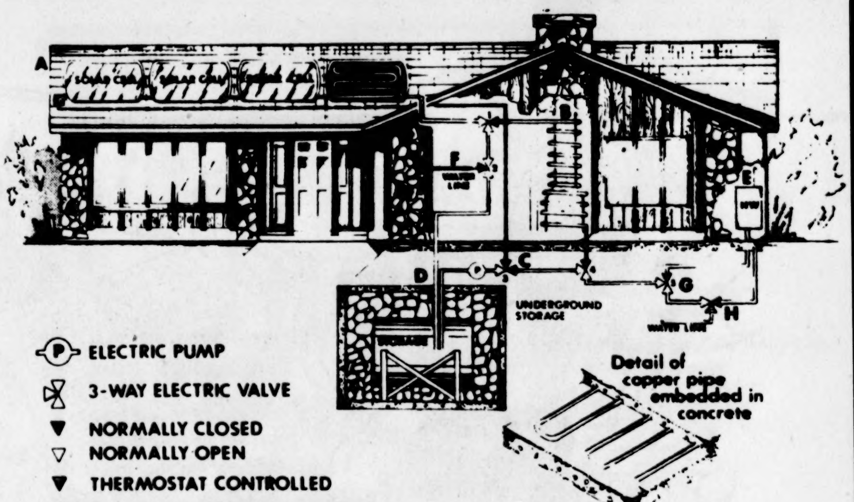

**Solar Energy Climatic Control**

Once installed, the solar energy heating system is energized by opening the valve (2) at point F, which fills the storage tank. When the float level sensor indicates that the tank has been filled, then valve (3) at point C opens to allow the pump to push water from the storage tank through the solar cells and valve (2) at point F closes the input water line to permit water to circulate from the storage tank to the solar cells and back to the storage tank. The heat from the water inside the storage tank is allowed to radiate to the rocks surrounding the tank which serve as a heat bank from which the storage tank can withdraw heat when inclement weather drastically reduces solar heat. A supplemental source of heat, when solar heat is not sufficient (or at night), could be the heat now wasted by the fireplace. Point B illustrates the use of copper tubing surrounding the fireplace and a good portion of the chimney. When solar heat drops, valve (1) closes the solar cell pipe and opens the fireplace pipe and, simultaneously, valve (4) opens the fireplace pipe and closes the heating and hot water pipe. The storage water is then circulated through the fireplace and chimney until the house temperature drops to the point at which the thermostat calls for heat. At this time, valve (4) begins to modulate (i.e. open and close) the fireplace and heat pipes to maintain fireplace circulation and radiant heat circulation on an equal basis. Radiant heating systems cannot utilize the maximum temperature of solar heated water. There would be too great a heat rise due to the retained heat in the concrete slab and in the water in the circulating radiant heat piping. To offset this effect, cold water is blended with the water from the storage tank at the mixing valve shown at point H. On the other hand, the high temperature of the storage water is ideal for home hot water usage and, therefore, we direct the very hot water directly to the formerly electrically heated hot water tank. When a flow sensor on the hot water tank detects the use of hot water, the microcomputer opens water valve (5) at point G and increases the pumping speed for higher pressure to the hot water tank so that the home's water system will function in step with municipal water pressures.

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## CP/M Primer

*The computer operating system CP/M is becoming a fad in personal computer circles, but it also seems likely to last a while. It's so elegant it's been compared to a Rosetta Stone, unlocking the secrets of microcomputers for business use. This concise manual, generally regarded as the best CP/M introduction, is co-authored by Mitchell Waite, who also wrote the* **Computer Graphics Primer** *(NWEC, p. 532). Incidentally, publisher Howard Sams is the consistently best computer/electronics book publisher, and (sigh) one of the most consistently over-priced.*

—*Art Kleiner*
*[Suggested by Tony Bove]*

**CP/M Primer**
Stephen M. Murtha
and Mitchell Waite
1980; 96 pp.

**$11.95** postpaid from:
Howard W. Sams and Co.
4300 West 62nd Street
Indianapolis, IN 46266
or Whole Earth
Household Store

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Generally, any operating system can be defined as the interface between the computer and the computer user. *Its purpose is to provide the user with a flexible and manageable means of control over the resources of the computer.* The three primary functions fulfilled by all operating systems are:

1. Provide an orderly and consistent input/output (i/o) environment for the various elements of the computer (i.e., terminal, printer, hard or floppy disk, magnetic tape, etc.) to operate in. Input/output is a generalized expression that means responding to a key being depressed on the keyboard, sending a character to the screen or printer, etc.

2. Provide file management and status reporting for the data being stored in the computer system. A file management system will allow a user to find out what files are on a disk, how big the files are, how much unused space is left on the disk, as well as managing the reading and writing of information to and from the disk.

3. Provide for the loading and execution of user programs. Many operating systems have far more elaborate features such as the ability to execute more than one user task at one time, the ability to keep track of the amount of time each user spends on the system, a system of passwords to protect data and programs, etc. However, they all perform the three basic functions mentioned above in one form or another.

## Telephone

*Harper and Row commissioned business writer John Brooks to write a history of the telephone in America to commemorate the hundredth anniversary of A.G. Bell's patent of some "Improvements in Telegraphy" in 1876. By persuading A.T. & T. that he was entering the project without prejudice against the company, he obtained free access to their files and archives — the first outside writer to do so in many decades. The result is a wonderful history of America's nervous system (hello?), non-technical, but laden with legal and economic details about the world's largest corporation. Brooks does for the telephone what Erik Barnouw does for broadcasting: makes media history come alive.*

*The overall tone of the book is positive, as indeed many Bell decisions and achievements deserve praise — like the decision to rate-average local service charges, so that people who live in isolated places, where the need for phone service is arguably greatest, were not excluded from joining the system by having to bear the full cost of the additional wiring. But Brooks also exposes some very disturbing episodes — as when Bell Labs took over management of the U.S. nuclear weapons program in 1949 (after the University of California decided to quit, "on grounds that production and stockpiling of weapons were inappropriate activities for a university"). That Bell decided that these were appropriate activities for a telephone company is more than a little strange, but it had already contributed its managerial skills to the military during both World Wars. This time (in peacetime), there was a new wrinkle: Bell apparently took on the nuclear program with the understanding that the government would not press its recently announced anti-trust suit, which was aimed at separating Western Electric from the rest of the system and breaking it into smaller companies. The government subsequently dropped its suit in 1956, after Bell had overseen the design, production and testing of the first hydrogen bombs (Bell's nuclear activities were not necessarily the reason the suit was dropped). "As of the mid 1970s, Western Electric was still operating Sandia . . . with a changed mission that embraces 'the whole range of nuclear weapon systems conception, design, and development, excluding only the nuclear explosive package'."*

**Boy operators in an 1879 central office. Boys were employed in the first telephone exchanges until they proved to be unruly and somewhat unreliable.**

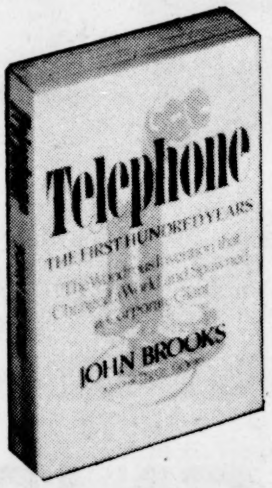
*But this is only one part of a much larger story. A.T. & T. has been responsible for many inventions that have transformed life in America, not to mention other countries. The real subject of* **Telephone** *is neither the telephone nor A.T. & T.; it is the impact that both of them have had on us.*

*—Robert Horvitz*

**Telephone**
(The First Hundred Years)
John Brooks
1975; 369 pp.

**$13.95** postpaid from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512

or Whole Earth
Household Store



## A History of Broadcasting in the United States

*This has become the standard reference on the subject, not just because of its rich and reliable factual base, but because of Barnouw's awesome skill as a storyteller, his precise shadings and juxtapositions of events, his feel for American life as it has co-evolved with the commercial mass media. Don't get the idea that this is just an industrial history. It is that, but Barnouw demonstrates that if you focus on perhaps the most powerful influence on American public consciousness, THE WHOLE CENTURY BEGINS TO MAKE SENSE. If this incredible saga were fiction, it would have been a best seller. But who could have made it up? This trilogy is a masterpiece of can't-put-it-down calibre. It has shaped my understanding of our crazy, fragile society more than any other book source.*

*—Robert Horvitz*

**A History of Broadcasting in the United States**
Erik Barnouw

**A Tower in Babel**
(Volume 1, To 1933)
1966; 350 pp.

**$14.95** postpaid

**The Golden Web**
(Volume 2, 1933-1953)
1968; 391 pp.

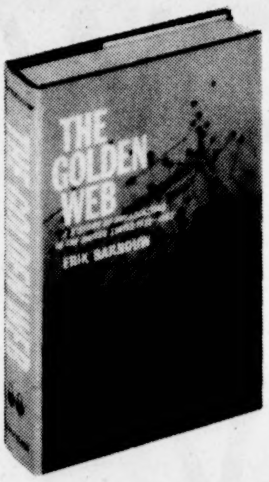
**$15.95** postpaid

**The Image Empire**
(Volume 3, From 1953)
1970; 416 pp.

**$15.95** postpaid

all from:
Oxford University Press
16-00 Pollitt Drive
Fair Lawn, NJ 07410

or Whole Earth
Household Store



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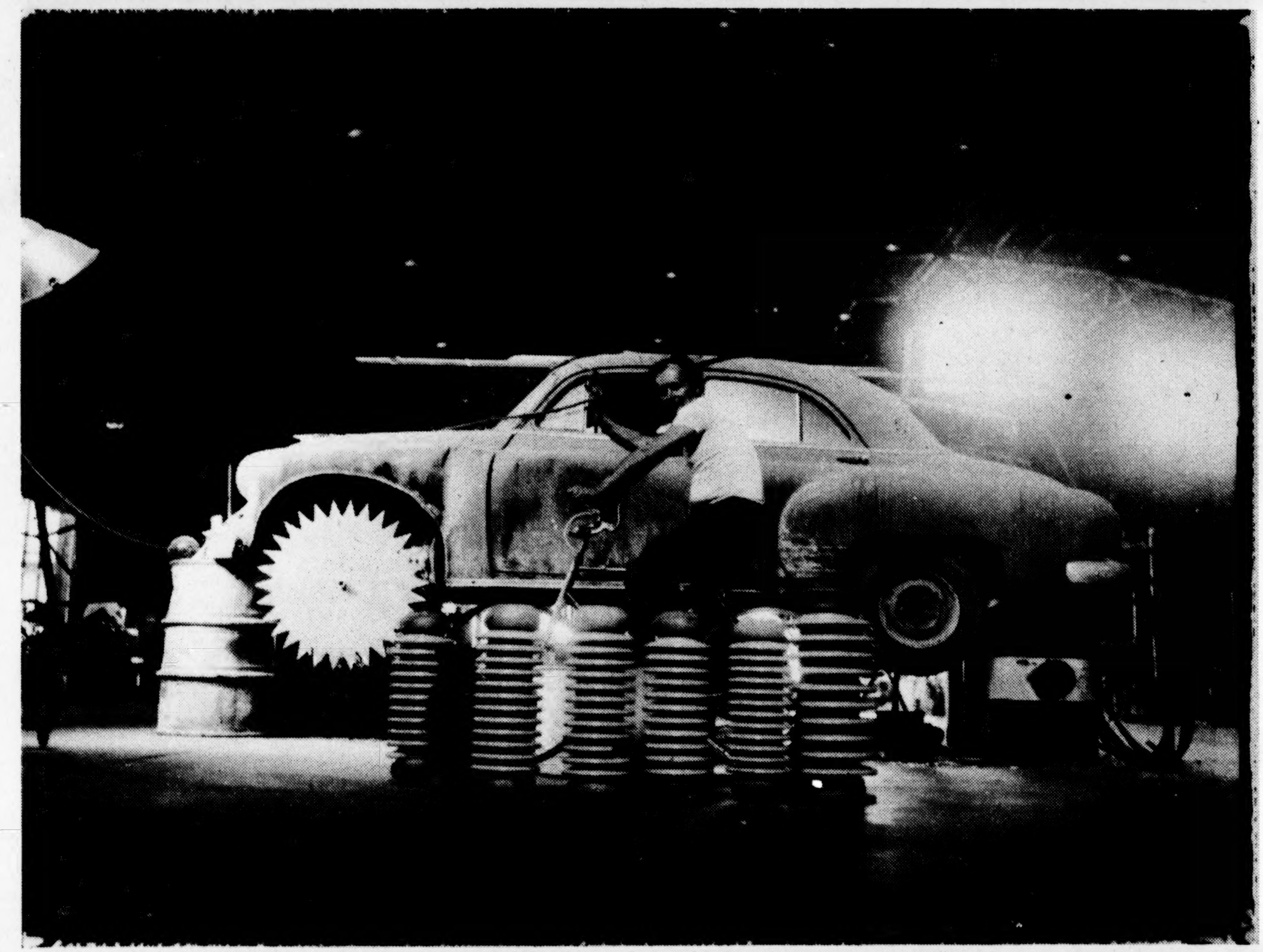
The push into Germany produced a discovery of fateful impact on radio as well as on other fields. The troops approached radio stations that were broadcasting but were found without personnel. The broadcasting was being done by a machine never seen before: the Germans called it a Magnetophon. A plastic strip, magnetically recorded, was broadcasting with a fidelity Americans had never before heard in a recording, and without surface sound. The principle of magnetic recording had long been known. The wire recorder was an application of it, and a steel-tape recorder was based on the same idea. But neither of these permitted easy editing. Miraculously, the German recorder used tape that could be cut with scissors and spliced with adhesive plastic tape, all without affecting the recorded material. Crates of seized tape recorders were sent to Washington for evaluation by the Signal Corps, but privately "liberated" samples also reached the United States. The complex disk-editing processes used at Armed Forces Radio Service were suddenly seen as obsolete. Spurred by "liberated" equipment, American imitations took shape. Before long American tape recorders began to appear — and to revolutionize radio production and programming, with repercussions in the phonograph, film, television, and numerous other fields.



# ENERGY AND HOW TO GET IT

*Proposal by Gary Hill for a film by Robert Frank, Gary Hill, and Rudy Wurlitzer*

***Film stills by Robert Frank***

WHEN SCIENCE means government and energy means power and power means weapons, force and coercion, how long can one man hold out, true to his aim?

On the edge of the Utah desert in the hangar of Enola Gay (the B-29 that dropped the first atomic bomb), Robert Golka is in labor. Alone but for Agnes Moon, his 77-year-old cook and consort, and 2 dogs (Nitro and Proton), disciple of Yugoslavian genius Nikola Tesla (whose design for the first alternating current generator opened up the modern electrical age), 41-year-old Electric Bob would give birth to the sun.

He has built from scrap a replica of Tesla's original coil, rising 51 feet above 2 acres of junk juke

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*Now funded by the Corporation for Public Broadcasting as part of its Independent Anthropology Film Series,* ***Energy and How to Get It*** *is being shot in early 1981. For more about Robert Frank see p. 3* –*SB* boxes, pinball machines, old transformers, slots, car parts, tangled cords, and water heaters inside his quonset hangar. The coil, attached to a 150,000 watt generator, is tripped by a hand cut saw tooth switch. With it Golka creates 25 million volt lightning bolts – "the highest man-made voltage anyone has ever made in the world" – one fourth the power of natural lightning, one step closer to his real aim.

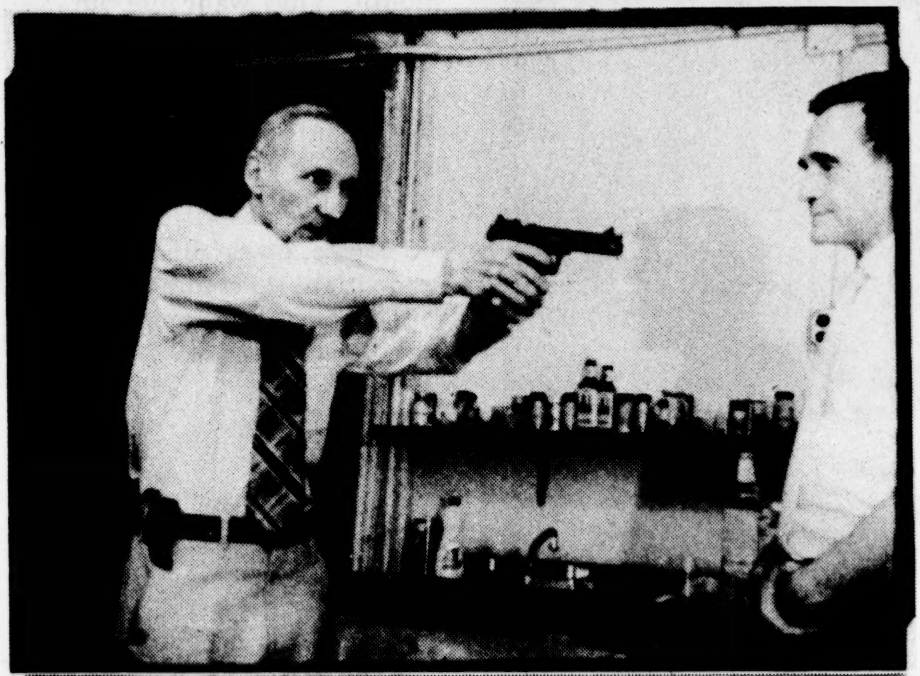
Eighty-one years ago with the original coil, Tesla made ball lightning, which comes not in zigzag bolts but in connected clumps. It is a plasma, a fireball of superheated gases contained in its own magnetic field. Golka believes that whatever can be learned about the forces that contain ball lightning can be applied to fusion research.

"Fusion," he explains, "is the bringing together of hydrogen atoms to form a helium atom. In the process, when you transmute one element into another, you give off heat. And when you're talking about atoms, you're talking about a billion times a billion atoms per cubic centimeter, which amounts to a tremendous amount of heat. If we could find a way to contain plasma, we could bring the transmutation around slowly. . ." – realizing Golka's aim, the creation of a clean, wireless, self-sustaining energy source 10,000 times safer than fission.

Unlike fission, the process used in current nuclear reactors which produces energy by splitting heavy atoms of uranium and results in tons of radioactive waste with a half-life of 200,000 years, fusion combines the nuclei of light atoms of seawater producing nonradioactive helium as its main waste product. Although some radioactive byproducts may result, these are not long-lived (which simplifies disposal), and there is no possibility of a melt-down type accident. "You can dynamite the thing while the reactor is running and you wouldn't throw out any fallout into the atmosphere," says Golka.

The House has just passed a bill calling for $20 billion in funds to be spent for fusion research. Thousands of Ph.D.s at MIT, Princeton, Los Alamos, and California's Livermore Laboratory are trying to solve the problem of containment – using magnets, mirrors, laser pulse. But when it comes to ball lightning research, Robert Golka (he studied electrical engineering at Northeastern University in Boston but did not graduate) is on his own.

Outside the corporate structure of Factory Science, his methods erratic, his inventions reminiscent of Rube Goldberg, Golka persists – an American pioneer, social outcast, artist. "I think true science is really an artform," he says. "It's got to be. That's the trouble with the scientists we have – they're like little machines, robots, cogs in the big wheel going nowhere." Though Golka too seeks federal funds for what he calls a fireball thermonuclear reactor, the head of the Advanced Fusion Concepts Branch of the Department of Energy who called his plan "a legitimate request" regrets that "we have a limited amount of money for advancing the ideas of ingenious people like Mr. Golka, to test ideas of special merit or value." And so Golka continues to work in the un-

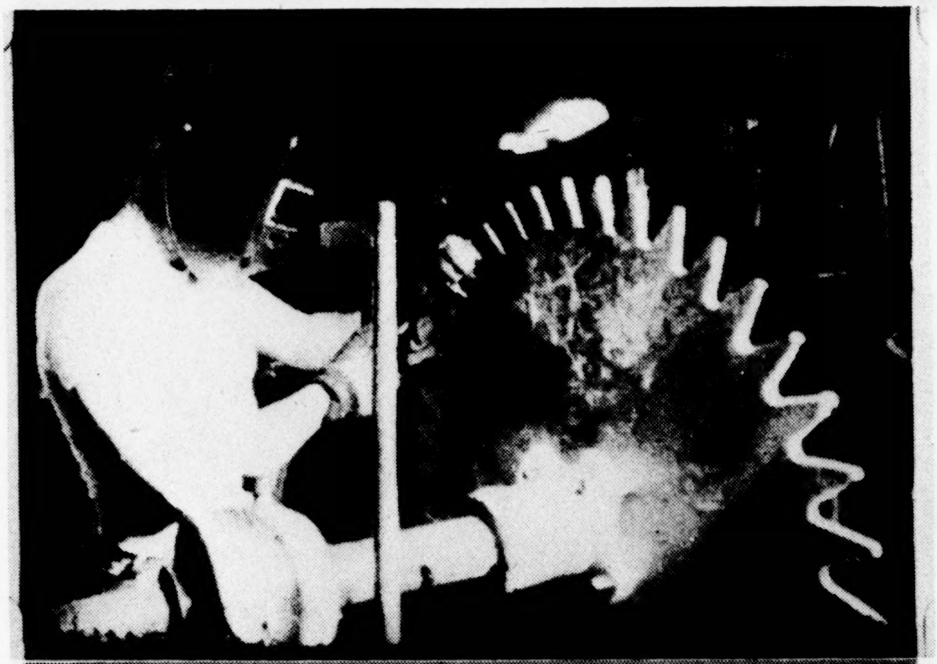


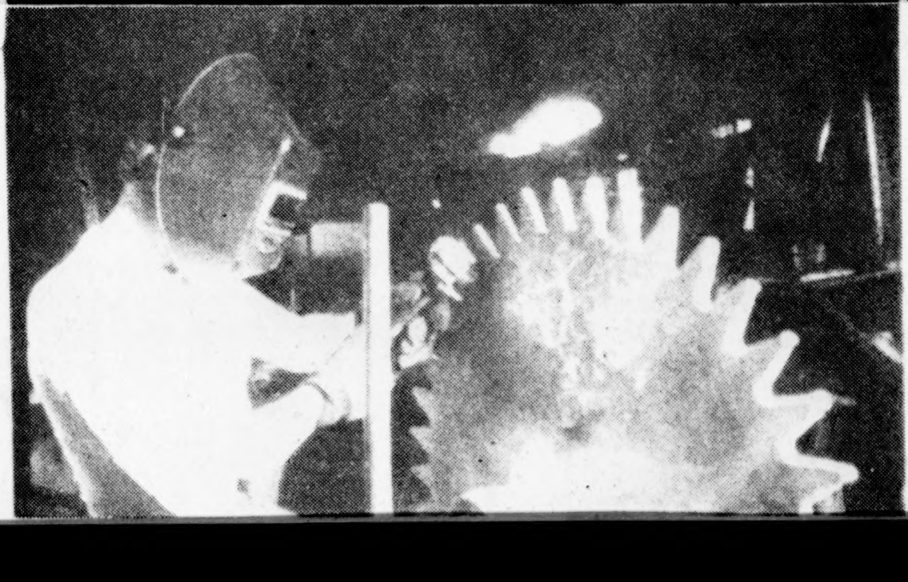
funded tradition of the basement inventor, with the temperament of the artist, with the materials at hand, with problems of his own. But for how much longer?

No frock coats, no chrome lab, no 25 million dollar bank of lasers – Golka lives with Agnes in a flat-tired trailer adjacent to the hangar he's leased from the Air Force for one dollar a year since hauling his dismantled lab in off the salt flats to do lightning research for them in 1974. Soon he was strobing the abandoned air base with 50-foot arcing jags of light pouring off his coil. Kids sought him out. He became a one-man circus, a figure of amazement, attracting national attention but no support. "Some people call him crazy – Crazy Bob. I don't. He's doing something no one else has ever done here," says R.J. Kearney, 12 years old. "Sure I think he's smarter than my teacher. My teacher never made bolts of lightning."

Then his contract with the Air Force expired and the Air Force relinquished the Wendover base to the town in 1977. Golka got a 3 year extension to stay on and do his work. But in February 1980, the town board upped his rent 2,400 percent to $300 a month. They want him out. Why? Mayor Hugh Neilson says "Golka is not exactly popular in town here. It's partly because he's eccentric and partly because most of the town feels like he's not accomplishing anything."

No degree, no establishment credentials, no credibility, his rental extension running out the end of the year, Golka stands



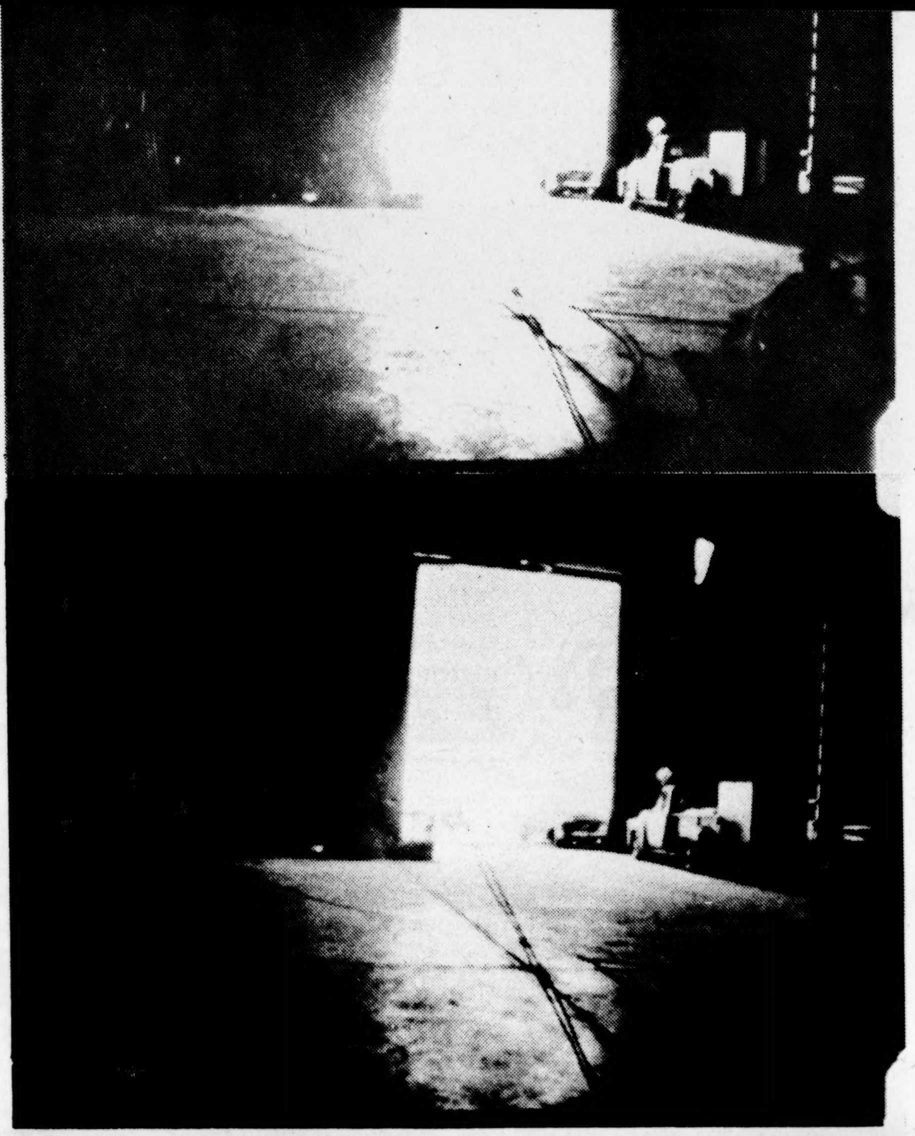


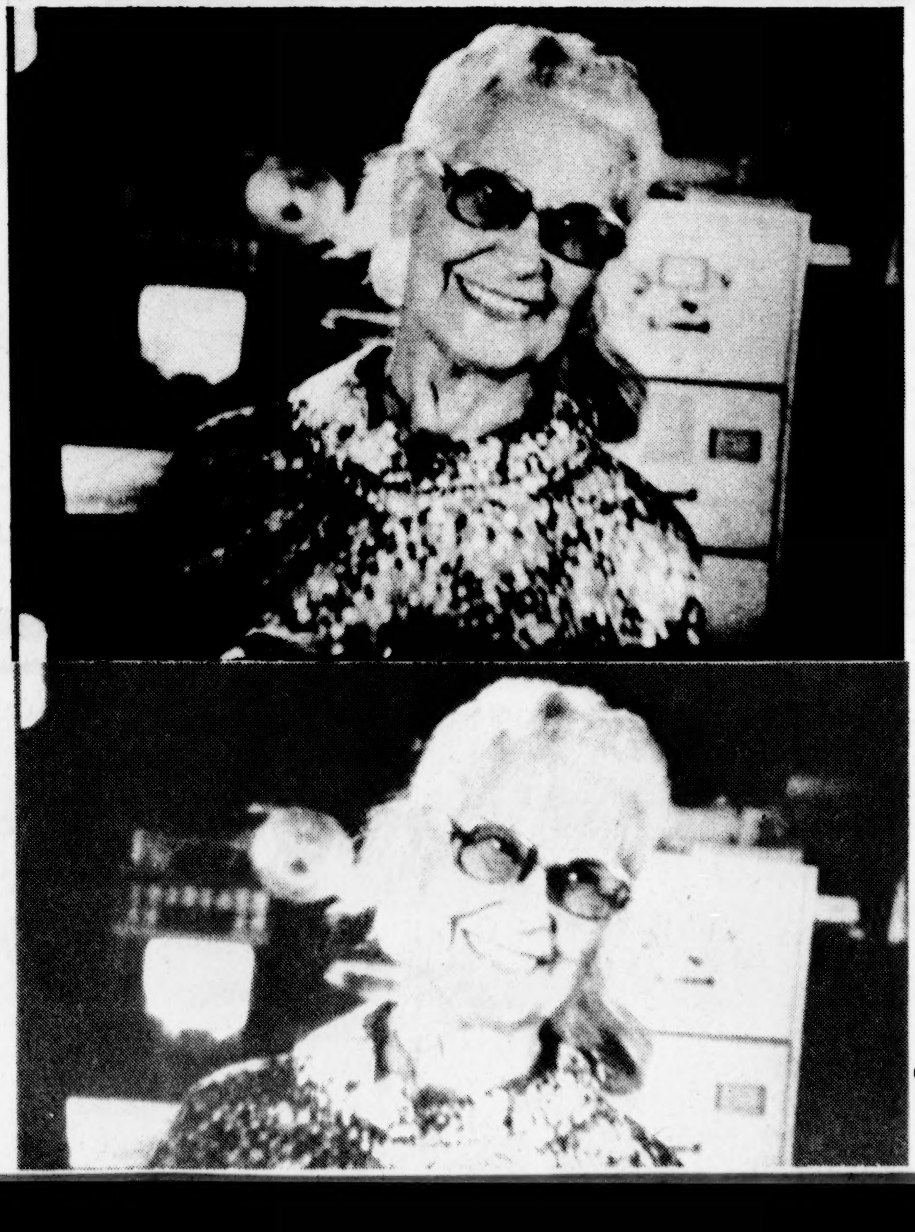
hip deep in junk parts, throws an arm around Agnes (who is old enough to be his mother) and talks about Tesla, his spiritual father: "Poor bastard only lived till he was 48. They just aggravated the shit out of him. It ain't going to happen to me because I don't get involved with universities and big corporations. But I can see how they'll steal it away from you. They try to take it away from you or run you to death or run you over or murder you. They've always done that. They've always screwed the inventor or the innovator. It's like a disease."

In the late fall of 1980 a lawyer/land developer showed up with plans for the airbase and a piece of advice. "Listen," he told his Independent Money Men, "of course we don't believe in what this crackpot Golka is doing, but there's money to be made here. We buy his diesel generator, his Tesla coil and his other half-baked inventions AS ART, as symbols of the singularity of the true creative genius of this man who worked against all odds – a desert Edison, a Galileo – hell, Copernicus! Buy his dream, canonize him, deify him, then kick his ass out."

What will Golka do?

Agree to the terms? Refuse? Will he think it's funny, a personal coup? Or will he demand more money? Retire? Has he had it? Will he give up? Or insist on one more try at his command post, in an attempt to create ball lightning – publicly this time, with the media there in a global hookup – one final blast at vindication? ■

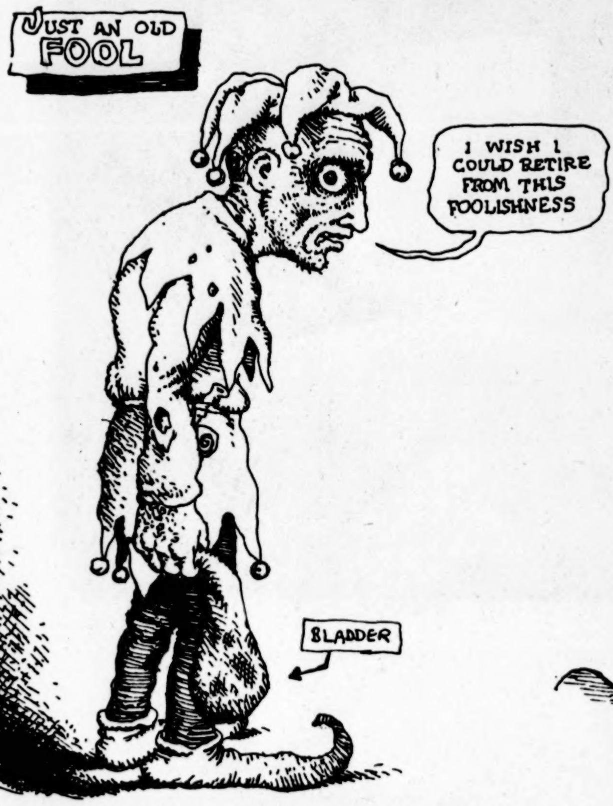


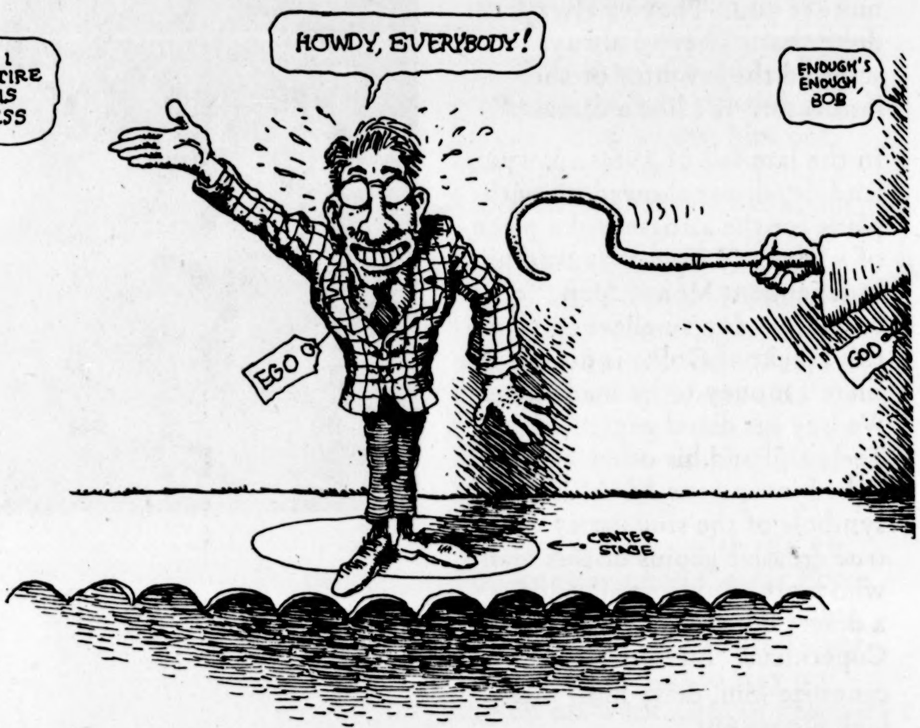


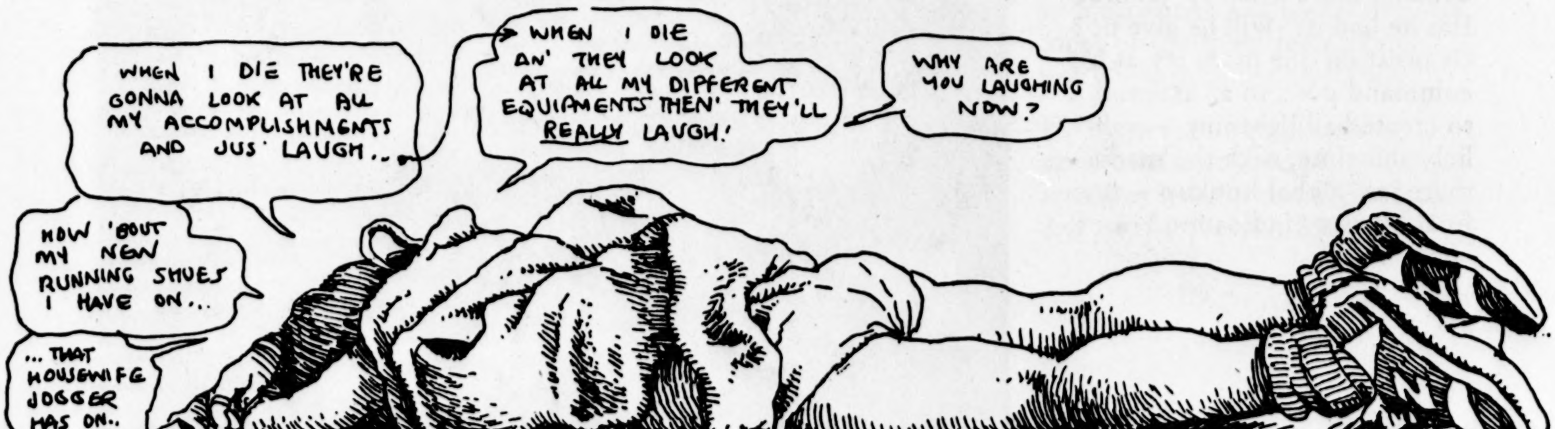
# From R. Crumb's Sketch Book

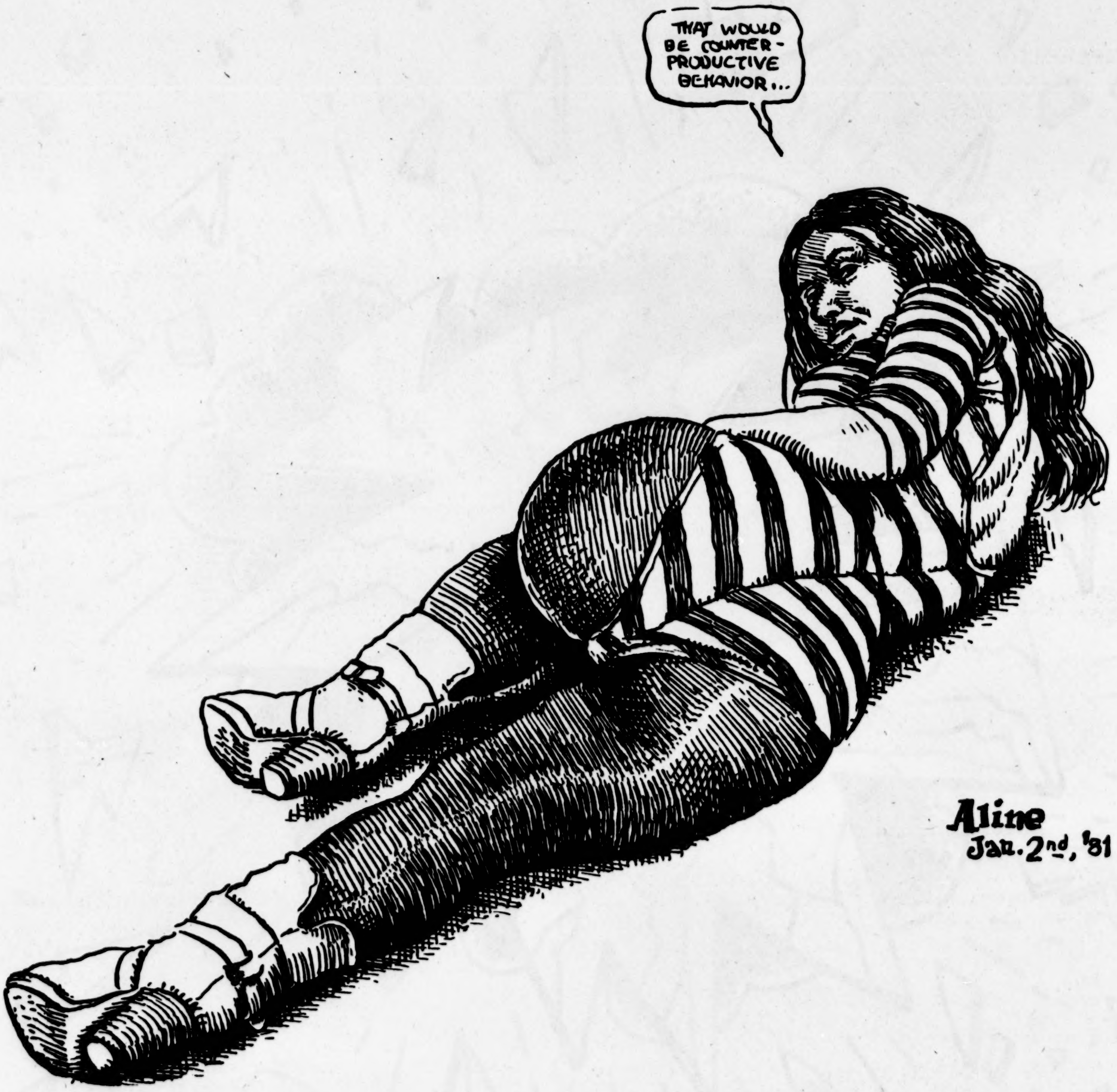
© COPYRIGHT 1981 BY R. CRUMB

## That's Show Biz ....


JUST AN OLD FOOL
I WISH I COULD RETIRE FROM THIS FOOLISHNESS
BLADDER


HOWDY, EVERYBODY!
ENOUGH'S ENOUGH, BOB
EGO
GOD
CENTER STAGE


WHEN I DIE THEY'RE GONNA LOOK AT ALL MY ACCOMPLISHMENTS AND JUS' LAUGH..
WHEN I DIE AN' THEY LOOK AT ALL MY DIFFERENT EQUIPMENTS THEN' THEY'LL REALLY LAUGH!
WHY ARE YOU LAUGHING NOW?
HOW 'BOUT MY NEW RUNNING SHUES I HAVE ON...
... THAT HOUSEWIFE JOGGER HAS ON..

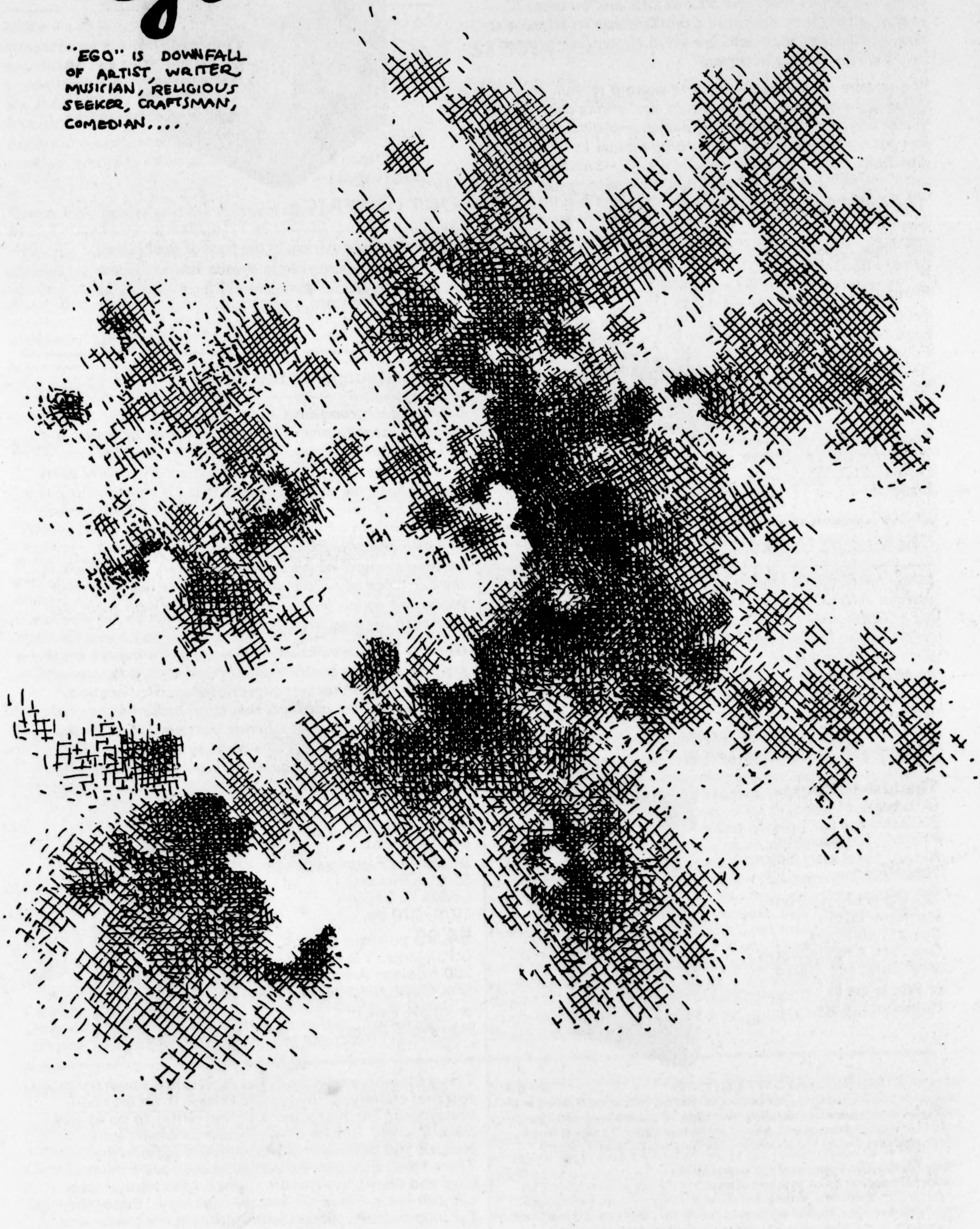

THAT WOULD BE COUNTER-PRODUCTIVE BEHAVIOR...
Aline
Jan. 2nd, '81

"SHATTERED NERVES"

TOO MUCH—

# "Ego"

"EGO" IS DOWNFALL OF ARTIST, WRITER, MUSICIAN, RELIGIOUS SEEKER, CRAFTSMAN, COMEDIAN....



## The Folio Society

*Looks like an excellent idea, and a great way to acquire handsome, durable editions of classics. It's a book club, therefore you're obliged to buy four books when you join. The books cost from $17 to $35, and include middle of the road literature from Trollope to Dinesen to Graves. Most of the books are set in letterpress, printed on "a single making of paper."*

*If one were building a library and wanted to include volumes to bequeath, these would last, unlike most made today with their disintegrating papers and bindings. One can get far more esoteric about bibliomania but that's not* **The Folio Society***'s point.* *—Stephanie Mills*

The Folio Society
Prospectus
1981

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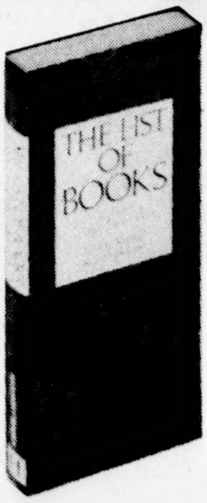
or
Folio Books
202 Great Suffolk Street
London SE1 1PR
England

## The List of Books

*Like a hasty-man's version of the 3-volume* **Reader's Advisor** *(***NWEC** *p. 510), this well-selected, well-annotated list of 3000 books in 44 categories can lead you to quality unguessed-at by best seller lists. The evaluation range is both British and American, the annotations are enlivened by Michelin-Guide-type glyphs for: "a particular pleasure to read"; "seminal book that changed our thinking"; "standard work on the subject"; "difficult, worth persevering"; "recommended for beginners in the subject"; "exceptional illustrations"; etc.* *—SB*

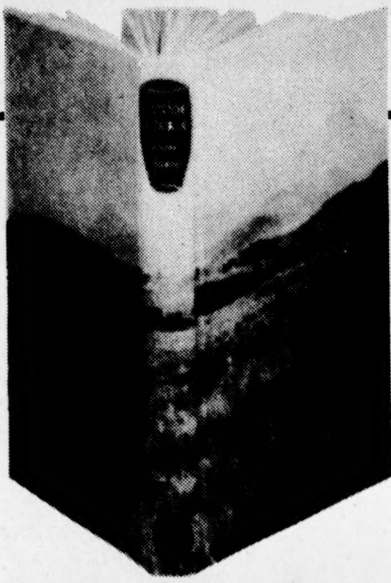


**The List of Books**
(A Library of Over
3000 Works)
Frederic Raphael and
Kenneth McLeish, Editors
1981; 160 pp.
**$8.95** postpaid from:
Harmony Books
Crown Publishers
One Park Avenue South
New York, NY 10016
or Whole Earth
Household Store

**Eliot, T. S.** *Selected Essays, 1917–32* (1932) ▮ ♀ a ★
Most of the best criticism by a great poet-critic. Radical in its sense of the value of a living tradition; varied (Hamlet, Baudelaire, Marvell, Dante) and with "the intellect at the tips of the senses". Also: *After Strange Gods*; *The Sacred Wood*; *The Use of Poetry and the Use of Criticism*. See Gardner; DRAMA; POETRY

**White, E. B.** *The Trumpet of the Swan* (1970) ★ ▮
Voiceless Trumpeter Swan, with help of small boy and advice from old cob, his own father, learns reading, writing, and ultimately happiness and self-respect. White's is a rare voice, of great distinction: beauty and "the tears of things" have seldom been better caught. (7+) Also: *Charlotte's Web*; *Stuart Little*. See DIARIES (Garnett, White); HUMOUR; REFERENCE (Strunk)

**White, T. H.** *The Once and Future King* (1958) ★
Compendious (700-page) fantasy on the life of King Arthur. White's combination of slapstick and erudition is unique—as if Laurel and Hardy were set down in a Middle Ages accurate to the last detail. Nearest analogy is Tolkien (qv); but White writes better, and his mode is historical rather than imaginative fantasy. (10+) See MYTHOLOGY (Malory)

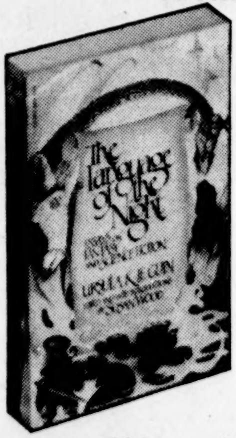


OUT OF AFRICA
*by Karen Blixen: linocuts by Peter Pendry.*
'I had a farm in Africa, at the foot of the Ngong Hills.' With these simple words Karen Blixen begins her classic account of life in Kenya in the 1920s. *Cloth printed with a photograph: 296pp: 9½" × 6¼".* *Pub. Oct. '80. $21.50*

## The Language of the Night

*Seeking background for a story about an aspiring fantasy writer, I casually picked up this collection of essays and talks by science fiction/fantasy novelist (and* **CQ** *contributor) Ursula K. LeGuin. Unexpectedly, nearly every page gripped me with an insight that I'd always intuitively felt but had never heard articulated. Some were esoteric: J.R.R. Tolkien's Frodo, Gollum and Sam are all fragments of one composite psyche. Others were universal: "While we read a novel, we are insane — bonkers. We believe in the existence of people who aren't there, we hear their voices, we watch the battle of Borodino with them, we may even become Napoleon."*

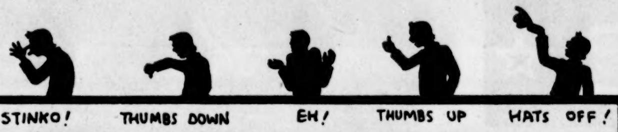
*Good as LeGuin's fiction is, these essays are more inspiring. Each insists gently that sci-fi, myth and fantasy are powerful and important because (when they're good) they play out the conflicts that brew hidden in our collective imagination. As a bonus, scattered through the selections are fragments of a great how-to manual for aspiring writers of high-quality imaginative stories — or hopeful readers of same.* *—Art Kleiner*

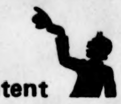
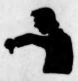
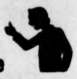


**The Language of the Night**
(Essays on Fantasy and
Science Fiction)
Ursula K. LeGuin
1979; 270 pp.
**$4.95** postpaid from:
G.P. Putnam's Sons
200 Madison Avenue
New York, NY 10016
or Whole Earth
Household Store

●

The artist who works from the center of his own being will find archetypal images and release them into consciousness. The first science fiction writer to do so was Mary Shelley. She let Frankenstein's monster loose. Nobody has been able to shut him out again, either. There he is, sitting in the corner of our lovely modern glass and plastic living room, right on the tubular steel contour chair, big as life and twice as ugly. Edgar Rice Burroughs did it, though with infinitely less power and originality — Tarzan is a true myth-figure, though not a particularly relevant one to modern ethical/emotional dilemmas, as Frankenstein's monster is. Capek did it, largely by *naming* something (a very important aspect of archetypizing): "Robots," he called them. They have walked among us ever since. Tolkien did it; he found a ring, a ring which we keep trying to lose. . . .



**Content**  **Style**  **Consequence** 

## The Journal of Irreproducible Results

*When I was in college, I hung out with a seedy crowd of computer scientists, mathematicians, and other techno-types who had their own brand of humor — virtually unintelligible to outsiders. The more lucid members of the scientific community contribute to* **The Journal of Irreproducible Results**, *a quarterly that spoofs scientific papers in a manner accessible to anyone who's ever puzzled over one. And at $3.80/year, it's a bargain.*

*—Leslie Allison*

**The Journal of Irreproducible Results**
(Official Organ of the Society
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Irreproducible Research)
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**$3.80** /year (4 issues)
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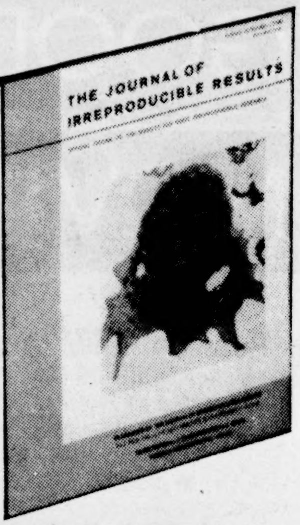

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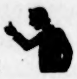
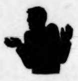
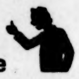
**Group Intelligence and the Political Scene**
*by P.T. DeLassus*

"The I.Q. of the group is the I.Q. of the dumbest member divided by the number of people in the group." While waiting to check-out of a hotel in Newark, Ohio, I overheard a young man recite this gem to a companion. I wasted considerable time that day chuckling over this accidental acquisition and making the obvious applications to committee work and team projects. Later, I wasted still more time developing the corollary which is the theme of this paper.

"The I.Q. of the elected official is equal to the I.Q. of the dumbest voter divided by the number of votes received."...

A city councilman may get elected with a few thousand votes. Graciously, we might guess the I.Q. of his dumbest supporter to be 82. Hence, our councilman might be expected to have earned an I.Q. of $4.7 \times 10^{-2}$. Similarly, a president might have earned an I.Q. of $1.3 \times 10^{-6}$. Indeed, the average man on the street, I.Q. 100, should be able to solve problems more quickly and clearly than a man operating with an I.Q. somewhere between chicken soup and kitty litter.

**Content**  **Style**  **Consequence** 

## MediaFile

*This newsprint tabloid for Bay Area underdog journalists is less boring than its slick counterparts like* **Columbia Journalism Review** *because it takes itself much less ponderously. Though produced by a local freelancer's group (of which* **CQ** *proofreader Nancy Dunn is president), it covers national media gossip with comprehensive panache. Its reporting on local press and radio is a model for what every city should have. If you want real background on community media, read what the freelance writers of your neighborhood read; their independence makes them hungry for true information.*

*—Art Kleiner*

MediaFile
The Urge To Purge
Radio Free Market

**MediaFile**
Warren Sharpe, Editor
**$10** /year (12 issues)
from:
Media Alliance
Fort Mason Center,
Building D
San Francisco, CA 94123

- Here comes Senator Strom Thurmond, noted South Carolina race-baiter, about to assume his duties as Grand Dragon of the Senate Judiciary Committee. With his cohorts Orrin Hatch, Paul Laxalt and Bob Dole, Thurmond hopes to revive the old Senate Star Chamber. The new title: The U.S. Senate Subcommittee on Security and Terrorism.

Robert Morris, former chief counsel of the original Senate Subcommitttee on Internal Security and current head of the National Committee to Restore Internal Security, can't wait to rekindle the fires of the witch-hunting past. "Certainly there's a greater need," Morris scowls, "than ever before."

When the press asked Mr. Morris whom would the new Senate committee investigate, Morris ticked off three Great Satans he saw as contributing to "weakening national security" — **Mother Jones** magazine, Pacific News Service and the Institute for Policy Studies in Washington.

●

NATIONAL FRONT: Look for some big changes in **Rolling Stone** very soon. *Jan "Wunderkind" Wenner* has decided to try to win back the older generation, who were the magazine's original readers, while trying to hang on to the teeny-bopper market. The plan is to downplay music — it'll be relegated to a few pages at the back of the book — and develop into a general interest mag. There'll be more politics, investigative reporting and personality pieces and a new format — full-page bleed covers and heavier stock. To bring this transformation about, *Terry McDonell,* formerly of **Outside, San Francisco** and **Rocky Mountain** magazines, has been made managing editor. As one staffer put it, "Wenner kidnapped him from his ranch in Montana and dragged him to New York with cow shit still on his boots." *Howard Kohn*, the original Bay Area Media Softball League Tsar, will be the mag's Washington correspondent. Looks like we'll be able to get Stoned again.

## What subscribers mean to small magazines

*Everything, and here is the best statement of that. It appeared last summer as an editorial comment in the Canadian "cultural media and news magazine,"* **Fuse** *($15/year, 6 issues, 31 Dupont, Toronto, Canada M5R 1V3).*

*—SB*

. . . Every reader that has any warmth towards any small magazine should take out a subscription. There are many reasons why this is a must. And I mean essential. Firstly, every small magazine would then become self-sufficient. For **Fuse** with a circulation of 10,000 we would operate on a budget of $90,000. This would mean that the production and writing labour of the magazine could be paid for. There would be no profit. I repeat — no profit. Secondly because not enough readers of such magazines take out subscriptions it means the following: a) twice as much time and energy is spent on raising money through hare-brained inefficient schemes — like Advertising and Distribution; b) that same scramble diverts the focus away from the function of a small magazine which in part is to develop alternate editorial content.

So by not subscribing to such magazines the reader is unintentionally dealing the magazine a death blow and simultaneously helps to editorially weaken his/her welcomed reading material. I'm afraid it's that simple. . .

Clive Robertson

# GOOD ☆ MOVIES

*by Sheila Benson*

Napoleon

☆

The chance to see Abel Gance's **NAPOLEON**, one of the most profound thrills in a decade of filmgoing, will not be confined to a lucky band of New Yorkers who saw it at Radio City Music Hall. It was tested there when Francis Ford Coppola et al. presented it with a live orchestra and a specially composed score, for one weekend only. New Yorkers' response was phenomenal – a black-and-white silent film made in 1927 became the most coveted ticket in town, and it was repeated an additional two weekends.

**Napoleon** is neither dry nor archaic history. (It may not quite be history; it is Gance's particular vision of Napoleon as a savior who rose to lead the French people during and immediately after the Revolution. The film ends on the crest of the Italian campaign before imperial dreams enveloped Bonaparte.) All Gance did in 1927 was to invent Cinerama, or rather Polyvision – his own three-screen process which went Cinerama one or two or three better. Its simultaneous triple screens encompassed separately story, memory, and emotion, or were fused into one vast panorama. "The story is prose. The center is the story," Gance said, "the wings – the side screens – are poetry."

**Napoleon** still exists because of a slight, modest Englishman, Kevin Brownlow, who dedicated 30 years of his life to the patient reconstruction of **Napoleon**. It had never been seen in its proper form since its unveiling at the Paris Opera in 1927 until 1979, in which this 4-hour-plus version, although without music, was presented one night under cold Colorado stars at the Telluride Film Festival. Brownlow commented that, to Gance, the stationary camera was feeble, its "tripod was a set of crutches supporting a lame imagination." *Nothing* fetters Gance's imagination, it soars high as he envisions Napoleon's own spirit as an eagle beating its way across the vast screens. From Gance's editing emerges the sort of time elisions usually credited to Alain Resnais; he whirls a heavy, bulky camera around as if it were a Panaglide, becoming at moments completely subjective. Gance also mounted his camera on a galloping horse, strapped it to an actor's chest and hung it from a pendulum swinging out over the French Convention (where the chances of it falling on the massed extras terrified them so that, as Gance said happily, "their cringing improved the scene considerably").

**Napoleon** has at least five major sequences: the snowball fight between the schoolboy Napoleon and a rival fort in military school; the intercut storms at the Convention and at sea, as Napoleon sails in his tiny boat; the Bal de Victimes, in which Gance proves himself the equal of Erich von Stroheim in shimmering decadence; the seige of Toulon, which Napoleon attacked at midnight in the teeth of a storm, in which you can almost smell the sodden felt uniforms and feel whipped by the drenched plumes on the officer's hats; and the Polyvision vista as Napoleon leads his ragged army into the rich plains of Italy. Interestingly, Gance's is not the impersonal cinema of massed bodies and stylish editing. Gance is French and romantic; it is his faces which burn their way into your memory forever. With a shock you see in Albert Dieudonné, the adult Napoleon, the face of a dark, sooty-eyed Rod Stewart.

At the moment, the national tour includes the Ohio Theatre in Columbus, March 19 to 22; the Hollywood Bowl in late May or early June; and the Oakland Paramount, June 26th. Theaters are limited to ones which have room enough for the Polyvision screen, an orchestra pit big enough to accommodate a 60-plus orchestra, and a full concert organ. But if it comes anywhere near you, do not miss it, and if you do see it, please drop me a note. I'd be greatly interested in how CQ readers react to this astonishing work.

☆

**MELVIN AND HOWARD** is a notable way to lose your heart. It is probably the most fun to watch of any film of the last year, and its residue is even sweeter. Both director Jonathan Demme and screenwriter Bo Goldman seem infused with affection for its characters, as well as comprehension down to the tiniest detail. Melvin Dummar (Paul Le Mat) is its hero, an eternally hopeful, debt-ridden Everyman who finds Howard Hughes in the middle of the desert at night, injured and snarling like an old animal. The two spend a few hours driving across the quiet desert to Las Vegas, and some years later Melvin finds himself a $156,000,000 beneficiary in Hughes' will.

Glowing steadfastly in the center of the film is Mary Steenburgen as Dummar's first love Lynda, his wife of both the spirit and flesh, though the spirit flags somewhat after their *n*th repossession. (The fallout from this, a portrait of generations of kids who struggle up from marriages which come apart and together like Lego blocks, is also splendid.) The feral Pamela Reed is Dummar's second wife, a lady who knows what she wants and goes after it, and Jason Robards is eerie as the definitive late Hughes. The story's locations are exactly right, from beached trailer homes behind their abalone-shell fences to Las Vegas marriage mills and the calculated ecstasy of television give-away programs, yet Tak Fujimoto's photography seems to burnish them kindly. Don't let anyone tell you this story is simple; it is soft but its artful delicacy hides a brilliant American portrait. ■

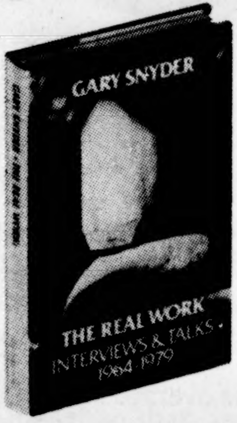
Howard and Melvin

## The Real Work

*If I were asked, "What is the major impulse that you and your cohorts operate by these days?" I would struggle for a while with words like "regionalism," "local politics," "neighborhood vigor," and then launch into excited tales about recent adventures with Sausalito waterfront developers (some good, some terrible) and City Council members (some good, some terrible). If you could shut me up long enough to inquire, "Where did the impulse come from?" I would have to say Gary Snyder, somewhat in his poetry but mostly in his conversation. This book is a collection of such conversations. He's a brilliant talker, careful, densely informative, and sprightly.*

*Why list the thing here rather than in politics? Because the Sausalito waterfront, for example, is a whole system. That's why something can be done with it. California is not a whole system, nor is America, and not much can be done with them, but you have to try, and that's politics. However, you have to stay at least partially immersed in local real work, or you lose heart.* —*SB*

**The Real Work**
(Interviews and Talks
1964-1979)
Gary Snyder
1980; 189 pp.
**$4.95** postpaid from:
New Directions Paperbacks
W.W. Norton and Company
500 Fifth Avenue
New York, NY 10036
or Whole Earth
Household Store



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Get the people grounded and the poetry'll take care of itself.

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The thing about a network is that everybody speaks the same language and more or less agrees with each other. The thing about a community is that you don't all agree with each other and there are problems that you have to live with and work out over a long scale of time. I find for my work and my own spiritual growth that the kind of life that happens in a community is, if anything more valuable than that of the network. Because the network really does encourage you to think that you're important, but the community doesn't.

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Erasing all negative associations for the word "primitive," it means *primus* or "first," like "original mind," original human society, original way of being. Another curious thing about the relationship between "primitive" and "civilized" is that no primitive society ever became civilized of its own free will; if it had the choice, it stayed itself. . . .

"Civilization" is analogous to a piece of scraped-back ground that is kept perpetually scraped back so that you always get a lot of grass quickly every year — monoculture, rapid production, a few species, lots of energy produced, but no recycling to fall back on.

Neighborhoods are allowed to deteriorate, landscapes are allowed to be strip-mined, because there is nobody who will live there and take responsibility; they'll just move on. The reconstruction of a people and of a life in the United States depends in part on people, neighborhood by neighborhood, county by county, deciding to stick it out and make it work where they are, rather than flee. . . .

I've spent years arguing the dialectic, but it's another thing to go to supervisors' meetings and deal with the establishment, to be right in the middle of whatever is happening right here, rather than waiting for a theoretical alternative government to come along.

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If you've planted fruit trees that won't bear for a few years you begin thinking in terms of the future. If you have a set of sophisticated knowledges about the right plants and the right planting season for your garden on a certain elevation on a certain slope — and it comes down to that kind of precision — and you're sending that kind of knowledge to the next generation, you're not going to sacrifice it to just any strip-miner that comes down the road. And this is ultimately how we get our food, by these kinds of detailed understandings and teachings with regard to the delicate propagation of plants which are sensitive to the finest variations in climate and soil. Any true farmer, and practically nobody else, understands this. The fact that most of us don't understand this is a measure of our curious and anomalous way of being in the world, of our alienation.

## The Divine Woman

*A true wish book. A study of shamans and rain goddesses — a look at mythology backstage, a glimpse of the cogwheels of religion. After you close the book, it is difficult to look out of the window the same way. An important book from North Point Press, a new venture that is publishing other books of similar quality.*
—*John Graywood*

*Good companion reading: Maxine Hong Kingston's fierce* **The Woman Warrior** *(1977; $2.95 postpaid from Vintage Books, Random House, 400 Hahn Road, Westminster, MD 21157).* —*SB*

**The Divine Woman**
(Dragon Ladies and
Rain Maidens)
Edward H. Schaefer
1973, 1980; 239 pp.
**$7.50** postpaid from:
North Point Press
850 Talbot Avenue
Berkeley, CA 94706
or Whole Earth
Household Store

The Divine Woman

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In the belly of the furnace of creativity is a sexual fire; the flames twine about each other in fear and delight. The same sort of coiling, at a cooler slower pace, is what the life of this planet looks like. The enormous spirals of typhoons, the twists and turns of mountain ranges and gorges, the waves and the deep ocean currents — a dragon-like writhing. —Gary Snyder (from the foreword)

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The scene opens among the twelve peaks of Shamanka Mountain, then shifts to the highland spot where the ancient king dreams alone. He is not shown walking with the poet Sung Yü as in the great tradition, but resting in the course of a hunting expedition; he dreams not by daylight but in the night. The goddess appears:

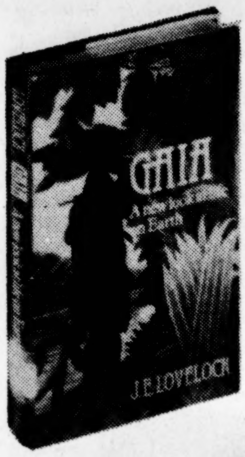
"Drifting mist, light and pink, moistens a ravishing form;
Driving rain flies off and away — shining stars are few".

She disappears, and the ape voice of the king cries out in desolation. In the sequel the radiant vision is pursued with resolution — by whom? As the gibbon's cry fades away, the whispering rain becomes everything, concealing a lonely ghost. The soul of a king a thousand years dead finally achieves a second union: the damp fog congeals to form the doorway to a woman's chamber.

# Is Nature Really Motherly?

### *by W. Ford Doolittle*

*The Gaia Hypothesis says that Earth's biosphere is in effect one organism. How does a species of one evolve? There's nothing for natural selection to select among.*



**Gaia: A New Look at Life on Earth**
by J.E. Lovelock
Oxford University Press
157 pp., $11.95

THE GOOD THING about this engaging little book by Jim Lovelock is that reading it gives one a warm, comforting feeling about Nature and man's place in it. The bad thing is that this feeling is based on a view of natural selection – that force which alone is responsible for the existence and characteristics of the biosphere – which is unquestionably false. And that is discomforting, because the book is written for a lay readership which may be misled about the extent to which the biosphere can be safely abused, and because the hypothesis it presents has been accepted as daring but tenable by otherwise rational reviewers of popular scientific literature[1]. I will try to present Lovelock's ideas in the same appealing and forceful way in which he presents them, and then show why these ideas are inconsistent with everything we now think we know about the evolutionary process, and embody a kind of logical fallacy for which I am sure logicians must have a name.

Lovelock seeks to explain why conditions on Earth (in particular, its surface temperature, and the chemical compositions of its atmosphere and oceans) differ so dramatically from those on its dead neighbors Venus and Mars. He seeks to explain how these peculiar conditions, which are essential for the survival of life as we know or can imagine it, have never, in the three to four billion years since life began, altered so drastically as to destroy all life. And there are indeed many wonderful things which seem to *demand* explanation.

(1) The average surface temperature of the earth has been maintained, Lovelock claims, at between ten and twenty degrees centigrade for more than three billion years. This in spite of the fact that energy input from the sun has increased some thirty percent during that period and lethal global temperatures well below or above those at which water either freezes or boils might easily have prevailed at various times during the Earth's history.

(2) By extrapolation from the atmospheric compositions of Venus and Mars, one would expect an earthly atmosphere of some 98 percent carbon dioxide, 2 percent nitrogen and only traces of oxygen, which would not support complex forms of life. Instead, we find only 0.03 percent carbon dioxide, 79 percent nitrogen and 21 percent oxygen. These concentrations, as well as those of trace gases such as methane, nitrous oxide and ammonia, differ by many orders of magnitude from equilibrium concentrations calculated from the known rates of chemical reactions between various atmospheric components. The atmosphere is somehow maintained in a chemically most improbable state of disequilibrium.

(3) Each atmospheric gas can be assigned a life-supporting function, and is present in optimal concentration. Carbon dioxide is required for photosynthesis and all life ultimately depends upon it, but if it were present in significantly higher concentrations, a devastating "greenhouse" effect would be produced. Nitrogen serves to

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[1] See Kenneth Mellanby, **New Scientist**, October 4, 1979; René Dubos, **Nature**, November 8, 1979; Phillip Morrison, **Scientific American**, March 1980.

dilute oxygen, a dangerously flammable gas, and is the primary maintainer of atmospheric pressure. Oxygen is essential for respiration, and thus all animal life, and its present concentration of 21 percent seems optimal, just neatly below that at which even wet wood burns and forest fires would never self-extinguish. Lovelock presents data showing that if oxygen concentrations were to rise to above 25 percent "very little of our present land vegetation could survive the raging conflagration which would destroy tropical rain forests and arctic tundra alike." Oxygen levels are kept high, but below this critical point, by reactions with other atmospheric gases such as methane, of which some one billion tons are produced annually by bacterial activity, and nitrous oxide, also a biological product. Nitrous oxide is implicated as well in the regulation of stratospheric ozone concentration. So is methyl chloride, another biologically produced gas. Ammonia is significant in controlling oceanic acidity and may have, during the early history of the Earth when the Sun was cooler, kept Earth warm enough to support early life, because it, like carbon dioxide, exerts a greenhouse effect.

(4) The annual input (from the land) of salt into the sea is about 540 million tons. At this rate, it should take a scant 80 million years to achieve the present level of salinity (3.4 percent). The oceans are some 400 times older than that, and one should wonder not why the sea is salt, but why it is not concentrated brine. In fact, the oceans seem to have maintained something like their current level of salinity throughout much of their history, and it is very fortunate for life that they have. Salinities of as little as six percent are lethal to all but a very few specialized salt-tolerant organisms.

From these and other examples, Lovelock concludes that "the climate and the chemical properties of the Earth now and throughout its history seem always to have been optimal for life," which seems hard to dispute, and that "for this to have happened by chance is as unlikely as to survive unscathed a drive blindfold through rush-hour traffic," which may also be true. Hence the need for Gaia (loosely from the Greek, and meaning Earth Mother), which Lovelock defines as "a complex entity involving the Earth's biosphere, atmosphere, oceans and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet," and for the Gaia Hypothesis, which "postulates that the physical and chemical condition of the surface of the Earth, of the atmosphere, and of the oceans has been and is actively made fit and comfortable by the presence of life itself."

It is not novel to suggest that life has profoundly changed the Earth, but it is novel and daring to suggest that it has done so in a seemingly deliberately adaptive way, in order to ensure its own continued existence. This sounds purposive, but Lovelock is careful to avoid the teleological trap; he assumes Gaia is the product of natural selection. Just as natural selection has mindlessly molded the behavior of individual bees so that they maintain their common hive at an optimal internal temperature, it has molded the behaviors of all the individual producers and consumers of carbon dioxide, oxygen, nitrogen and methane, and of all the organisms whose activities can influence global climate and oceanic salinity, so that these parameters will be maintained within ranges hospitable for life as a whole.

Gaia, as a cybernetic system, must have mechanisms for sensing when global physical and chemical parameters deviate from optimum, and mechanisms for initiating compensatory processes which will return those parameters to acceptable values (negative feedback). These admittedly will be difficult to identify, and Lovelock's imagination fails him in all but a few cases.

For instance, he gives examples of devices by which the biosphere might control temperature. If cooling is a problem, heat loss might be curtailed by reducing the Earth's albedo (or reflectance) by darkening its surface. Lovelock notes that algal mats, which may have covered large portions of the early Earth, are known today to be capable of darkening, and muses: "could these black mats, produced by life forms with a long ancestry, be living remnants of an ancient method of conserving warmth?" "Conversely, if over-heating were the cause of trouble, a marine biosphere would be able to control evaporation by producing a monomolecular layer with insulating properties to cover the surface of the waters. If evaporation from the warmer regions of the oceans were hindered by this means, it would prevent the excessive accumulation of water vapour in the atmosphere and the conditions of runaway heating by infrared absorption." Maybe so, but how does Gaia know if she is too cold or too hot, and how does she instruct the biosphere to behave accordingly? All Lovelock can say about this, after a long argument by analogy with body temperature control mechanisms in animals, is that "even though we may find evidence for a Gaian system of temperature regulation, the disentangling of its constitutive loops is unlikely to be easy if they are entwined as deeply as in the bodily regulation of temperature."

Atmospheric oxygen, the product of photosynthesis, can be kept in check by methane, the product of a diverse collection of ancient bacteria, the methanogens, which produce this gas in a variety of oxygen-free environments, principally anaerobic muds at the margins of seas, lakes and marshes. For Gaia to work as a cybernetic system, methanogens must somehow respond to increasing atmospheric oxygen by more vigorous production of methane. Here Lovelock does a little better. Writing Andrew Watson and Lynn Margulis[2], he argues that increased oxygen leads to local overgrowths of oxygen-utilizing microbes in the waters overlying the muddy homes of the methanogens. The subsequent death and burial of these microbes enriches and extends the anaerobic (oxygen-free) environments in which methanogens thrive. This is a plausible scenario, and perhaps the most fully developed one Lovelock has to offer.

Lovelock's scheme for biological control of the saltiness of the sea seems much more strained. He notes that "excess salt accumulates in the form of evaporites in shallow bays, landlocked lagoons, and isolated arms of the sea, where the rate of evaporation is rapid and the inflow from the sea is one way." Such evaporation ponds will indeed decrease overall salinity. Lovelock then makes the "bold speculation that [these] lagoons formed as a consequence of life in the sea . . . Constructing vast barriers of the size needed to enclose thousands of square miles of sea in tropical regions may seem an engineering task well beyond human capabilities. Yet larger by far than any man-made structures are the coral reefs, and more significant in former times the [algal] stromatolite reefs. These are constructed on a Gaian scale, with city walls miles high and thousands of miles long, built by a cooperative of living organisms. Is it possible that the Great Barrier Reef, off the northeast coast of Australia, is the partly finished project for an evaporation lagoon?" I guess it *is* possible, but Lovelock is silent on the question of how Gaia knows her oceans are becoming too salty, how in response she instructs reef builders to construct such evaporation lagoons and why, in the last analyses, these intrepid creatures obey her instruction.

But it is not the difficulty of unravelling Gaian feedback loops that makes me doubt her existence. It is the impossibility of imagining *any* evolutionary mechanisms by which these loops could have arisen or now be maintained. In Hugh Lofting's book **Doctor Dolittle in the Moon**[3], John Dolittle marvels at the absence of Darwinian competition among the lunar flora and fauna. This, it turns out, reflected the dominance of "The Council," which was "made up of members from both the Animal and Vegetable Kingdoms. Its main purpose was to regulate life on the Moon in such a way that there should be no more warfare." Dolittle remarks to his aide, "our world that thinks itself so far advanced has not the wisdom, the foresight, Stubbins, which we have seen here. Fighting, fighting, fighting, always fighting! So it goes down there with us . . . The 'survival of the fittest'! . . . It is this thing here, this Council of Life – of life adjustment – that could have saved the day and brought happiness to all." Lovelock's Gaia is very much the terrestial equivalent of Lofting's lunar Council. But the Council was created by Otho Bludge, the first moon man and a refugee from Earth. Who created Gaia?

Lovelock is not explicit, but he implies that Gaia evolved as life evolved and if he is to be taken seriously at all, he must mean that she is the product of natural selection operating in the normal way but on a grand scale. And that must mean that organisms (or at least those with important geochemical impact) which behave in such a way as to contribute to the maintenance of Gaia have a greater probability of leaving offspring than those which do not.

Natural selection *always* has to operate in this way. That unit of selection which is more capable of long-term propagation than its competitors will (barring chance catastrophe) thrive at the expense of those competitors. There is currently controversy among evolutionary biologists – not about this nearly tautological axiom – but about what precisely is the unit of selection. The choices are the gene, the individual or the species ( interbreeding population). Richard Dawkins, in **The Selfish Gene**[4], makes an especially compelling case for the gene as the unit of selection. In holding this view, he and other "sociobiologists" like E.O. Wilson differ from some earlier believers in "group selection" who maintained that traits which are detrimental to the individual but beneficial to the species will be maintained within a population by natural selection operating on the species as a whole. Sociobiologists like to interpret such apparently "altruistic" behavior in selfish terms: although such behavior may lead to individual death, it increases the probability of survival of genes for altruism the altruist shares with his relatives in the population. It is probably correct to say that most evolutionists now doubt that genetically-determined altruistic behavior without such an underlying selfish component can arise through natural selection. Sociobiologists have gotten into trouble only because they have tried to extend such reasoning to human behavior, where cultural determinants can operate independently of, and often in opposition to, genetic determinants. It is certainly correct to say that no serious student of evolution would suggest that natural selection could favor the development in one species of a behavior pattern which is beneficial to another with which it does not interbreed, if this behavior were either detrimental or of no selective value to the species itself. Mutually beneficial interspecies symbioses of course can arise: bees visit flowers because they get food that way, and flowers encourage bees to do so, because their pollen is spread in this way. In all such mutually beneficial symbioses, both partners must derive advantage, and each and every evolutionary step taken by one or the other partner in the development of a symbiosis, no matter how complex, must be immediately and individually beneficial to that partner.

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[2] Andrew Watson, James E. Lovelock and Lynn Margulis, **Biosystems**, Vol. 10, 293-298, 1978.

[3] **Doctor Dolittle in the Moon**, by Hugh Lofting (J.P. Lippincott, 1928).

[4] **The Selfish Gene**, by Richard Dawkins (Oxford University Press, 1976).

Gaia is a symbiosis (or mutualism, in Wilson's terminology[5]) of global dimensions. The individual species comprising the partnership are immense in number and diverse in kind, and the time scale over which the actions of each member affect the welfare of all exceeds by many orders of magnitude the generation time of any. I cannot believe that natural selection could, without the intervention of something like Lofting's "Council," produce such a magnificent creature. For each member of the partnership to behave responsibly, there must be selective pressure against irresponsible behavior will not be felt for thousands or millions of years, during which time irresponsible mutants, which may well have a temporary selective advantage, would have replaced all responsible members of the species.

Lovelock himself provides a doomsday scenario in which an (artificially created) phosphate-sequestering photosynthetic microorganism grows explosively over all the waters of the Earth, disrupting all Gaian feedback loops and ultimately destroying all life on Earth, itself included. The scenario is not implausible, but Lovelock rejects it, saying "it was good to have no less an authority than John Postgate confirm that this brief essay in science fiction is indeed just a flight of fancy. In real life, there must be taboos written into the genetic coding, the universal language shared by every living cell. There must also be an intricate security system to ensure that exotic outlaw species do not evolve into rampantly criminal syndicates." I acknowledge the authority of Dr. Postgate, but what are these taboos? If evolutionary genetics and molecular biology have taught us anything, it is that the "purpose" of DNA (which embodies the genetic coding) is the making of more DNA, and in particular more DNA of its own kind. The means are as different as the different modes of reproduction exhibited by all living species, but the ends are always the same, and always justify the means. That is what evolution is all about, whether we like it or not. And what, specifically, is the "intricate security system" – it sounds like Lofting's "Council" – but who are its members and how do they function?

The rewards for good (Gaian) behavior are as remote as the penalties for bad behavior. It is difficult to accept that behaviors whose effects on atmospheric or oceanic composition or global temperature will not be felt for thousands of generations can be selected for, especially when the first beneficiaries of those effects may be organisms which are not themselves responsible for them. The construction of an evaporation lagoon for sequestration of sea salt may benefit the biosphere as a whole, in the very long run, but what in particular does it do for the organisms who construct it, especially in the short run? The global conflagration expected if oxygen levels exceed 25 percent would be disastrous to most higher forms of life. But it would produce a large amount of carbon dioxide and consume a lot of oxygen, and it is carbon dioxide which is the life-giving substrate for methanogens and it is oxygen which they must scrupulously avoid (because it is toxic to them). Would methanogens not in fact benefit, at least for thousands of years, from such a disaster? Organisms which produce methyl chloride may indeed help to regulate ozone in the stratosphere, but unless ozone varies quickly in response to their activities and ozone concentrations influence their own survival, there is no guarantee that methyl chloride will be produced in appropriate amounts.

I do not doubt that some of the feedback loops which Lovelock claims exist *do* exist, but I do doubt that they were created by natural selection, or that they are anything but accidental. Methane production may now balance oxygen production nicely, but it is *not* written into the genetic codes of either oxygen producers or methane producers that this should be so, and either could easily get out of hand. Accidental balances are fragile things, and their maintenance depends upon chance.

If the fitness of the terrestrial environment is accidental, then is Lovelock not right in saying that for life to have survived to reach the stage of self-awareness "is as unlikely as to survive unscathed a drive blindfold through rush-hour traffic"? I think he is right; the prolonged survival of life is an event of extraordinarily low probability. It is however an event which is a prerequisite for the existence of Jim Lovelock and thus for the formulation of the Gaia Hypothesis, and I think it is therefore logically fallacious to assume that any explanation other than chance is required. Can we not assume that there is an immense number of planets on which life independently arose and then through some global catastrophe was extinguished before the evolution of self-awareness? And should we not expect that on those few planets on which intelligent beings arose, because such a catastrophe by chance did not occur, someone would seek to explain his own survival by the invocation of some protective device such as Gaia? Surely if a large enough number of blindfold drivers launched themselves into rush-hour traffic, one would survive, and surely he, unaware of the existence of his less fortunate colleagues, would suggest that something other than good luck was on his side.

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[5] **Sociobiology: the new Synthesis, by E.O. Wilson (The Belknap Press of Harvard University Press, 1975).**

Cosmologists seem to have grappled with a similar problem. B.J. Carr and M.S. Rees pointed out recently[6] that "the possibility of life as we know it evolving in the Universe depends on the values of a few basic physical constants, and is in some respects remarkably sensitive to their numerical values." They do not assume, however, that life has manipulated these constants (which *a priori* could have many other values) for its own ends, because there is a simpler explanation. Only the known values are *potentially observable*, because other values would not have permitted the evolutionary development of observers. Similarly, only a world which behaved *as if* Gaia did exist is observable, because only such a world can produce observers.

Does it matter if Lovelock is wrong, and the apparent stability of the biosphere reflects not the operation of a global cybernetic system created by natural selection to maintain conditions which are optimal for life, but sheer good luck? Yes it does, because Gaia, if she exists, has built-in corrective mechanisms and buffering systems which will protect the biosphere against many potential threats to its survival. An accidental system, although it may have some accidentally-developed buffering capacity, is inherently fragile and cannot evolve in the adaptive way Gaia could (if she were real) in response to new threats.

The last two chapters of Lovelock's book are

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[6] B.J. Carr and M.J. Rees, Nature, Vol. 278, 605-612, 1979.

## *James Lovelock Responds*

*A Bishop recently asked me "Which came first, Life, or Gaia?" Dr. Doolittle's critique assumes that Life did and that Gaia as a development of Life cannot exist – for natural selection as he interprets it would not permit it.*

*I prefer to regard Gaia at this stage of knowledge as a manifestation of tendency in this Universe for complex systems to be stable and survive. Interestingly, R. Dawkins in his book "The Selfish Gene" also raises the possibility that Natural Selection among systems predated Life and that Darwin's great work was a subset of a deeper generality. To illustrate this point consider a hurricane. It is not living but it is an association of vortices which is much more stable and has more style than any mere low on the weather map. We recognise hurricanes as proto-life and give them names. It is even recognised among mathematicians that systems of differential equations when they interact tend to a kind of homeostasis.*

*Doolittle may be right that the selfish genes would never wish to form a trades union like Gaia. But what he and other evolutionists seem to ignore is the fact that the presence and the products of life inevitably and inexorably modify the environment.*

CATALOG OF THE UNIVERSE (CROWN, 1979)

**Thunderstorms over the Amazon tropical rain forest seen from Apollo 9. The current jeopardy of the rain forest may jeopardize Gaia.**

*The options then open to life as a whole are constrained by its past activities. It is not a big step for loops to then begin to close and for life to become included within a larger albeit tenuous entity. It may be difficult from deep within the dogma of molecular biology to think of the cybernetic consequences of evolution but the loop is not open, it is closed, and Gaia may not after all be inconsistent with natural selection.*

*The second part of his critique concerns environmentalism. Doolittle attributes to me the belief* devoted to interactions between Gaia and her newest and potentially least responsible partner, man. Lovelock writes "it is now generally accepted that man's industrial activities are fouling the nest and pose a threat to the total life of the planet which grows more ominous every year. Here, however, I [Lovelock] part company with conventional thought. It may be that the white-hot rash of our technology will in the end prove destructive and painful for our own species, but the evidence for accepting that industrial activities either at their present level or in the immediate future may endanger the life of Gaia as a whole, is very weak indeed."

Lovelock *does* worry about the possibility of matricidal destruction of Gaia, but he worries about it in a different way. For instance, he considers the sloppy use of spray cans to be a relatively harmless perversion, because Gaia has already established cybernetic systems for maintaining atmospheric ozone at levels suitable for the survival of the biosphere. It is not the poisons which man produces which threaten Gaia; we can only kill her by displacing vital members of the partnership whose metabolic activities are essential components of the many feedback loops. And we can do this by perturbing the environments in which these essential partners live, in particular the "tropics and the seas close to the continental shores. It is in these regions, where few do watch, that harmful practices may be pursued to the point of no-return before their dangers are recognized . . ." Lovelock is right in pointing out these danger points, because even if natural balances are only accidental, we perturb them at our peril. But, *unless Gaia really does exist*, he is wrong in suggesting that we need not be equally concerned about spray cans, about the increasing production of carbon dioxide which results from the use of any organic matter as fuel, about acid rain, or about any of the other threats to global survival around which properly concerned environmentalists construct their various doomsday scenarios. Herein lies the danger in accepting the existence of Gaia. ◻

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*that Gaia by taking care of everything gives industry a green light to pollute at will. This is not what I said. I think that there is only one pollution, namely people. When there are too many of them almost anything, even eventually breathing, can be a pollution. Ever been in a London Underground train at rush hour, which breaks down in a tunnel? Try it and see what I mean.*

*I am not unconcerned about $CO_2$ or acid rain or even the ozone war. I just think that the environmentalists have their priorities misplaced. They agonize over a still unproven hypothesis, that the current production of fluorocarbons might slightly deplete ozone, when the tropical forests are being ripped off at a rate which could eliminate them in two decades. This to me is truly straining at the gnat while swallowing the camel.*

*Furthermore the ozone scare looks to be ethnocentric. Apparently it is OK for Indians to suffer rickets from lack of UV but it would be terrible if a few whites suffered cosmetic damage from curable skin cancer. In fact ozone is still increasing, so it is the Indians who are losing the ozone war.*

*Although I disagree with Dr. Doolittle's criticism of Gaia on environmentalist arguments, I am very grateful to him for rousing my interest in molecular biology. Perhaps he may find cybernetics equally rewarding.* ◻

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# *Lynn Margulis Responds*

***(Microbiologist at Boston University who collaborated with Lovelock on Gaia Hypothesis. A brief biography of her career appeared in the Spring 1980 CQ.)***

## Gaia lives, has blurred boundaries

*Doolittle's review of Jim Lovelock's book* Gaia *is marvelous for its brevity, accuracy, and clarity. It is the single best statement about what is valuable in that book that I have seen. However, it suffers from several grave errors, the first in the second sentence.*

*Single factor hypotheses of the evolutionary process went out with the 19th century. That natural selection alone is the force "responsible for the existence and characteristics of the biosphere" is patently false. There are at least three components to the evolutionary process, each itself multifaceted: faithful replication (high heritability); inherited variation (of many sorts — point mutations, duplications, chromosomal alterations, karyotypic fissions, hereditary endosymbioses); and natural selection. Without the first two, natural selection has nothing upon which to act. Taken together the evolutionary process does explain the emergence of Gaia as a control system, although admittedly many detailed mechanisms — indeed most — remain to be explained.*

*Doolittle admits that the difficulty of unraveling Gaia's feedback loops does not make him doubt her existence. Thus everyone is in agreement that*

*(Lynn Margulis on Gaia, continued)*

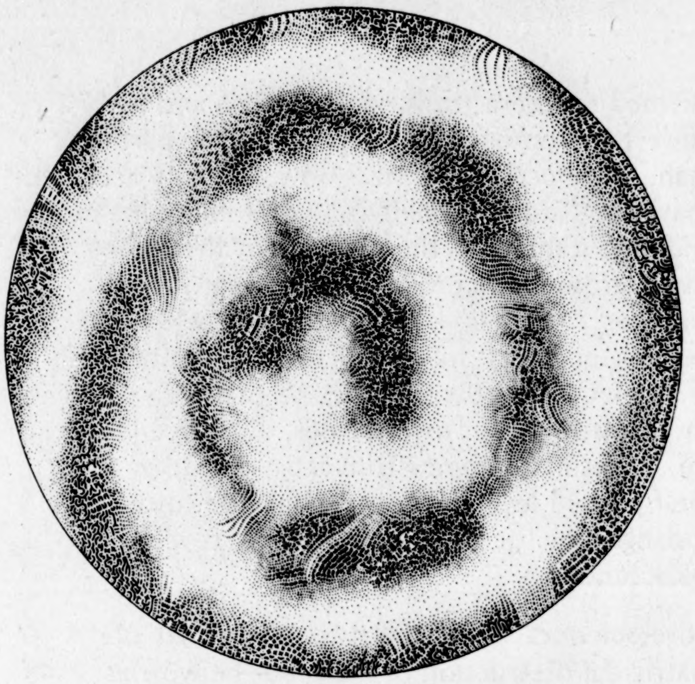
*there is a phenomenon (environmental natural regulation, atmospheric and oceanic homeostasis) which requires explanation. Doolittle's problem is: "the impossibility of imagining any evolutionary mechanisms by which these loops could have arisen or now be maintained." He goes on, "It is difficult to accept that behaviors whose effects on atmospheric or oceanic composition or global temperature will not be felt for thousands of generations can be selected for, especially when the first beneficiaries of those effects may be organisms which are not themselves responsible for them."*

*These two statements form the crux of Doolittle's criticism. The first point, bemoaning a paucity of mechanisms, is a feature of scientific paradigms that always work themselves out. A phenomenon is recognized, a sum of many observations, yet it is unacceptable in polite scientific society because no conceivable mechanism exists to explain that phenomenon. I will give several examples of this and then reject this criticism as invalid. Continents cannot drift because no mechanism that moves them can be imagined. Blood cannot be regulated in temperature and ion composition because the body cannot possibly know how to regulate it. The sun cannot be so hot because no chemistry exists that produces such wildly high temperatures. Atomic nuclei are indivisible units of mass, therefore they cannot give off radiation. Organisms are so perfectly adapted to their environments they must have been created; no natural mechanism exists which could so perfect them. Water has just exactly the properties required for sustenance of living systems; this could not have occurred by chance. And so forth. The history of science is full of the Wegeners and Galileos and Harveys whose observations were rejected because their phenomena, at first, had no mechanistic explanations.*

*Mechanisms for Gaia will emerge as they are further sought.*

*The second point, that evolution is opportunistic and not foresighted and therefore selection acts directly, not on remote organisms thousands of years in the future is perfectly valid. I could not agree more. But there is no need to invoke preplanning. The beneficiaries are immediate. The cumulative effect however can be seen as a phenomenon that persists on a geological time scale.*

*There is a problem, as Doolittle notes, concerning the "unit of selection." The problem is the nature of the question. Asking, "What is the unit of selection?" is analogous to asking, "What is the Aryan or Caucasian type?" Non questions. (There are no types, only populations comprised of individuals in which certain traits are present in high frequency.) Whenever there are too many replicating units for the space and resources (genes, intracellular organelles, offspring, families, tribes, cultures, varieties, and even entire species), some persist and some fail to persist. Thus selection acts at various levels at differing time scales on various recognizable entities. Like most questions in biology, the answer is "more than one of the above is true."*


ROBERT HORVITZ

*Let us consider a simplified Gaian example. For some external reason the temperature of the atmosphere increases, the solar luminosity rises. Local temperatures increase, and organisms that replicate faster at higher temperatures in some local environments leave more offspring. They crowd themselves out as their waste products are spewed into the environment, and they rapidly produce local conditions unfit for their continued reproduction. That is, they produce conditions for other species to reproduce faster. If the second species can dissipate solar energy in the form of heat loss more effectively and survive in the excrement of the first, the second species will begin to leave more offspring at that site. Natural selection working on different species and different individual members of those species will lead to the ecological "successions" so routinely observed in nature. If, as environmental stresses continue, physiological and ecological reserves are exhausted, evolutionary process will begin to prevail. That is, with continuing stress, if no species, dormant or active, at that site and at that time, can survive the environmental pressures, then extinctions and radically different patterns of differential survival will emerge. Ecosystems themselves will change.*

*These sorts of severe pressures occur on the fringes of Gaia — in the Antarctic deserts, on the high mountains, in the polluted streams. Species diversity decreases, the total number of individuals in the habitat decreases and selection pressures are fierce for any recombinants, mutants, and colonizers that can carry on and eventually modulate conditions around them.*

*What Doolittle has overlooked are phenomena between the molecular and the biogeological,* *namely the physiological, developmental, populational and ecological. All of these are in direct continuity since life is continuous in time (over 3 billion years at least) and in space (over the major portions of the Earth at least). Doolittle hints at this himself when he says, "For each member of the partnership, there must be selective pressure against irresponsible behavior (the production of too much oxygen . . .) such that irresponsible mutants among the population will be less likely to leave offspring." Exactly. Not only that, less responsible (which equals less adapted) members in those interacting neighbor populations will be less likely to leave offspring. Since ecological interactions, sexual recombination, and gene transfer in the normal sense are probably more important for everyday Gaian functioning than is mutation, it is differential growth of normal individuals and polymorphs that maintains stable conditions. Mutation and natural selection of mutants probably is a last resort after other sources of variation have been exhausted. But all of these mechanisms are occuring simultaneously. Their relative importance at any given time or place has not been assessed.*

*No doubt there is some role of chance as well. We are lucky that if all of the salt in the sediments were dissolved in the oceans we would still be less than a factor of 10 above the lethal value. We are still thanking our position relative to the Sun (if we were too far away we would be too cold, and if we were in the orbit of Mercury for example, we would burn). The issue then becomes: how much is luck and how much simply chance? It seems to me that the interacting group of people joined loosely into the so-called western cultural unit has been leaving too much to chance until recently. Enlightened self-interest (which means of course the privilege to leave one's own offspring) has led us to begin to adopt regulatory measures (attempts to clean the water and air, for example). That is completely in the Gaian style of homeostatic mechanisms. As the organisms produce environmental conditions unfavorable to their own maxima of reproductive rates, those that regulate that environment favorably for their own offspring leave more offspring. We think we are doing that. Furthermore we think we are doing that intelligently. (What presumption!)*

*I conclude that there is a basic agreement between Lovelock and Doolittle, but just a difference in emphasis. Lovelock sees Gaian mechanisms as well developed and tightly controlled. Doolittle sees a larger role for chance. Lovelock is willing to take larger risks with spray cans, Doolittle is more circumspect. Indeed, since there is no firm scientific basis for either position, decisions like banning spray cans and supersonic aircraft must be made on political, aesthetic, and other grounds. I suspect, however, that both Lovelock and Doolittle will agree what the ace up Gaia's sleeve is as environments become stressed beyond toleration. Some species evolve into other species more capable of coping and some become extinct. This of course is the fate of Homo sapiens as well, like it or not. How and when will we evolve into another species or go extinct? In 1984 by nuclear holocaust or by 22,001 gradually?* ■

## Gaian Geology?

*Dear CQ,*

*Thinking about the Gaia Hypothesis led me into an area only touched upon by Lovelock. What effect does life's appearance on land 400 m.y. (million years) ago have on rates of geological processes – especially erosion? Though geology has a uniformitarian bias, the appearance of land life was a "sudden" nonuniformity. If life altered some processes from that time on, some of our assumptions – based on current processes and a rock record strongly skewed both in extent and clarity to the period since land life – might not be transferable to the first 90% of Earth's history.*

*Limestone is an example. Practically insoluble in rainwater, it forms massive cliffs in lifeless regions. But as rainwater percolates through living soil, it combines with decaying organic material's abundant carbon dioxide to form carbonic acid which dissolves limestone. In general rock weathering proceeds faster in the root prodding chemical and moisture environment of living soil than in the environment of air or inorganic detritus.*

*Once rock is broken from bedrock, it can be transported away by water, wind, and gravity. But soil absorbs the sudden rains and releases the water slowly and evenly, minimizing the exponential erosive power of floods. The plant cover anchors the smaller rock particles most susceptible to wind and water transport. By slowing the rate of water erosion, life backs up the gravitational conveyor belt, slowing mass movement on the upper slopes.*

*If life hastens weathering but retards transport, it suggests life might alter the net rate of erosion. It doesn't prove it; quantification is required to determine the net effect (and surely any effect would vary with rock type and climate). But even the possibility that life alters rates of erosion suggests interesting hypotheses, for land is shaped by the interaction between the rate of uplift (or subsidence) and the rate of erosional removal (or deposition). Uplift of a limestone area, for example, might produce massive mountains 400 m.y. ago and rolling karst topography in the presence of life. However, since life is anti-entropic, I'd hypothesize that the pre-dominant effect of life's appearance on land would be a slowing of the erosional rate. The same deep tectonic processes might still occur but their surface manifestation would be different. Land might be higher today.*

*But this has further implications because the rate of uplift is an interaction between upward pressure from below and downward weight from above. If land is higher today, rates of uplift might be slower. If upper weight was being removed faster 400 m.y. ago, uplift might be faster then. So perhaps life influences even the time span of mountain building. This leads to many further speculations but it also leads back to the Gaia Hypothesis. For if life can influence the rate of weathering, erosion, and possibly even the rate of uplift, then Gaia influences the most important rates of the mineral cycles which are so important to life.*

*—Paul Krapfel*

# PRINCIPLES OF HOMEOPATHY

### *by Dana Ullman*

HOMEOPATHY IS A scientific study of disease. It is also a highly systematic study of health, the process of healing, and the laws of nature. Although homeopathy's scientific empirical foundation was formally developed in the early nineteenth century, its conceptual basis actually forms a futuristic twenty-first century science. Throughout the homeopathic literature, most of which includes books and professional journals written in the 1800s, there is discussion of the relationship between psyche and soma, the need for strict individualization in a person's treatment, the systematic and holistic view of the individual acting within the world, the effect of the environment on health, the formative intelligence within the individual, and the power of infinitesimal doses of medicines.

The futuristic principles of homeopathy are particularly valuable to learn for those people who seek a scientific study of disease while wanting to maintain a holistic perspective of the human organism. Specifically, the highly systematic methodology of homeopathy presents to practitioners and students of healing an empirically tested means for evaluating a client's* health, teaching the client to avoid suppressive therapies, determining an individualized homeopathic remedy, and ascertaining the client's prognosis. Homeopathy's holistic perspective prepares practitioners for beginning to deal with a variety of psychological and physical, acute and chronic, genetic and latent states of disease.

The study of homeopathy is valuable not only for those who wish to use the homeopathic remedies; its study is also valuable to any health practitioner or individual who wishes to understand the laws of nature, the principles of healing, and the meaning of health and disease. Many homeopathic principles also have a vast potential outside of the field of health care. Presently, many homeopathic principles are knowingly and unknowingly being used in physics, biology, psychology, agriculture, and other fields of study which will later be discussed.

*Having watched a number of friends go through various medical ordeals, I'm satisfied that when I contract some non-emergency ailment, my sequence of treatment approaches will begin with a reputable homeopathist. Of all the therapies available, homeopathists mess with you the least. But that's not why I'm printing this article. As allopathy (orthodox medicine) often takes a somewhat mechanistic view of the human organism, homeopathy takes a highly systemic view, and its operational principles are non-obvious, insightful, provoking, and perhaps applicable to understanding and treating other whole systems.*

*Dana Ullmann got his Master's in Public Health at the University of California, Berkeley. He's been teaching, writing, editing, publishing, and practicing in the field of homeopathy and holistic health since 1974. He was arrested in 1976 for practicing medicine without a license but since has been appointed to a special board committee within the state medical board reviewing the usefulness of the law that got him. (There are a number of doctors I would like to see arrested for practicing medicine with a license. The medical establishment is rather more diligent at policing outside itself than in. You ask a good doctor, "What about Dr. X?" "He's a butcher, a disgrace to the profession. Everybody knows about him." Everybody but the patients.)*

*See review of* **Homeopathic Medicine at Home** *on p. 106.*
*—SB*

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*The word "client" will be used in place of the word "patient" because "client" refers to the more active role that the person plays in homeopathic care.

**Classic homeopathy was especially popular in the U.S. in the late 19th century. This photo taken about 1895 is of the famed Boericke & Tafel Pharmacy in Philadelphia. Bottles are being labelled and filled with medication for the over-the-counter trade.**

**A brochure from the Smithsonian Institution notes:**

Far from being dead, Boericke and Tafel, Inc., has gone from a declining retail trade to over 50% of their business in exporting to 51 countries. The Middle East, India, Pakistan and Bangladesh have shown the greatest interest in importing. South American countries are second and Africa and the Orient are the next largest importers. The amount of business usually depends on how much money the individual governments will allow out of the country. Thus politics, balance of payment deficits, and the world economy have a great effect on their business.

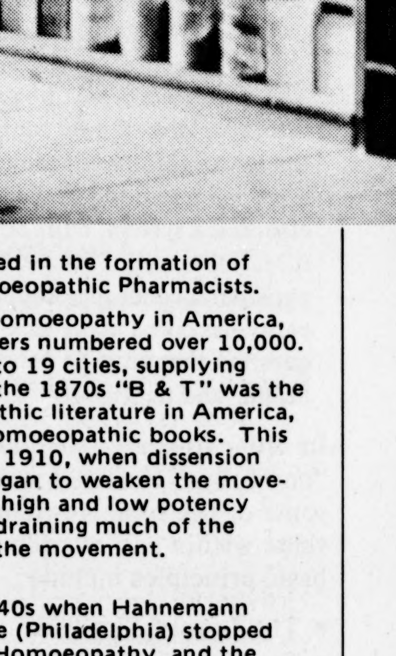
Boericke and Tafel is one of three major international exporters. They compete with Nelson's in England and Schwabbe in West Germany for the majority of the world trade. These three competitors also cooperate by selling each other remedies and raw materials unique to their part of the world. In 1945-1947, Boericke and Tafel supplied many of Schwabbe's customers because the plant was bombed by allied planes. Boericke and Tafel assisted their struggling counterpart in West Germany to restock after the war was over.

Boericke and Tafel is rich in the history of Homoeopathy, and was most prosperous during the late 1800s and the early 1900s. The company was formed in 1835 by William Radde from New York and J.G. Wesselhoeft from Philadelphia. This was the same year that such homoeopathic greats as Hans Burch Gram began practicing, followed by Dr. John F. Gray. Other names like Constantine Hering, Detwiller, and Wesselhoeft practiced near Philadelphia. Thus the merging of the movement in these two cities resulted in the formation of Boericke and Tafel, Inc., Homoeopathic Pharmacists.

This noted the expansion of Homoeopathy in America, until the number of practitioners numbered over 10,000. Boericke and Tafel expanded to 19 cities, supplying doctors and patients. During the 1870s "B & T" was the largest publisher of homoeopathic literature in America, producing nearly 85% of all homoeopathic books. This peak period lasted until about 1910, when dissension within homoeopathic ranks began to weaken the movement. Bitterness between the high and low potency schools of practice increased, draining much of the momentum and growth from the movement.

The final blow came in the 1940s when Hahnemann Homoeopathic Medical College (Philadelphia) stopped graduating doctors trained in Homoeopathy, and the pharmacists had to close down many of their shops. Homoeopathy of course didn't die, but its hibernation period lasts nearly to this day. Boericke and Tafel have noticed a resurgence in the last few years, as its domestic trade has caught up and is surpassing its foreign trade again.

This can only be good news to Donald Lee, Gus Tafel, and the few other homoeopathic pharmacists left in the country. Boericke and Tafel, Inc. with its stripped down retail store, fascinating production plant and an elevator that looks like it was built in 1835 can be found at 1011 Arch Street, in Philadelphia, Pennsylvania 19107.



Before discussing homeopathic principles, it is important to recognize that many homeopathic concepts are so significantly different from present medical perspectives that they are sometimes misunderstood. Occasionally, individuals who have studied homeopathy superficially criticize one part of it without understanding the context of the homeopathic perspective and practice.

Although homeopathy, like most fields of study, can be easily and seemingly logically criticized when one analyzes a part of it, it is important to study the integrity of the complete science before making firm judgments. Also, direct experience with the homeopathic remedies is recommended in order to understand better the homeopathic methodology and to subjectively ascertain its its effectiveness.

Despite criticism since its inception in the early 1800s, homeopathy has successfully survived. Almost every country in the world has homeopathic physicians, although the United States has only several hundred. Homeopathy is particularly popular in India where there are tens of thousands of homeopathic physicians and 40 four- to six-year homeopathic medical colleges. Homeopathy is also widely practiced in England, France, Germany,

## The law of similars: symptoms which are caused in overdose can be cured when the substance is given in a specially prepared small dose.

Italy, Greece, Russia, Mexico, Brazil, Argentina, and South Africa.

Mark Twain once said:

> ". . . (for) the introduction of homeopathy, which forced the old school doctor to stir around and learn something of a rational nature about his business, you may honestly feel grateful that homeopathy survived the attempts of the allopaths (the orthodox physicians) to destroy it." (1890)

Dr. Andrew Weil, Harvard botanical and drug researcher, has stated:

> "Homeopathy, if only for its enormous importance in the recent history of medicine, deserves the attention of everyone interested in the healing arts. It is a carefully elaborated system, built on the contributions of thoughtful physicians, and its methods cannot directly harm patients: a claim that allopaths cannot make. Homeopathy has cured many sick people; how it does so is a question that must be considered by all theorists of healing and treatment." (1978)

In order to begin to understand homeopathy's "carefully elaborated system," we will discuss some of the basic homeopathic principles and their value within and outside of health care. These basic principles include:

- **The Law of Similars**
- **The Energetic Essence within the Human Organism**
- **The Potentized Remedy**
- **The Homeopathic Proving of Remedies**
- **The Single Remedy**
- **The Minimum Number of Doses**
- **Hering's Law of Cure**

### THE LAW OF SIMILARS

"To like things like, whatever one may ail; there's certain help." Johann Wolfgang Goethe, **Faust**.

It is accepted knowledge that every plant, mineral, and chemical causes in overdose its own unique set of physical, emotional, and mental symptoms. It is also readily acknowledged that individuals, when ill, have their own idiosyncratic physical, emotional, and mental symptoms. The law of similars is conjectured by homeopaths to be a law of nature that affirms that symptoms which are caused in overdose can be cured when this substance is given in specially prepared small dose. Although this may be confusing at first, further explanation of this ancient principle as well as its modern applications will help clarify it.

The law of similars has been used throughout history and throughout the world, both within health care and outside of it. (Boyd, 1936; Coulter, 1973, 1975, 1977; (Grossinger, 1980. In the 4th century B.C., one of the Hippocratic writings stated, "Through the like, disease is produced, and through the application of the like it is cured" (Panos and Heimlich, p. 11, 1980). Paracelsus, a well known 15th century physician and alchemist, used the law of similars extensively throughout his practice and his writings. His discussion of the Doctrine of Signatures spoke directly of the value in using similars in healing. He affirmed, "You there bring together the same anatomy of the herbs and the same anatomy of the illness into one order. This simile gives you understanding of the way in which you shall heal" (Coulter, 1975, p. 432).

Samuel Hahnemann, a German physician and chemist in the early 1800s, was the first person to develop the law of similars into a systematic empirical health science and practice. Hahnemann popularized the phrase "*similia similibus curentur*" which means "like is cured by like," and he termed the medical system of its use to be homeopathy.

It is interesting to note that at the same time that Hahnemann was developing the homeopathic science, Edward Jenner, an English physician, was experimenting with giving small doses of cowpox vaccine to people in order to immunize them against smallpox. Jenner opened the door for the use of the *similia* concept in orthodox medicine. Today there are many treatments within modern medicine that consciously and unconsciously use the law of similars. Some examples include the use of digitalis for heart conditions (digitalis in overdose is known to creat heart problems), ritalin for hyperactive children (ritalin is an amphetamine-like drug), and radiation therapy for cancer (radiation causes cancer). Lest you think that any of these treatments are homeopathy, it must be made clear that they definitely are not. Although each of these medical treatments utilizes the law of similars, none of them follows any of the other essential principles of homeopathic prescribing. None of these drugs is individualized to the total physical and psychological traits of the client; none is pharmaceutically potentized to the **Homeopathic Pharmacopoeia** (1964); and with the exception of immunizations, none is prescribed according to the single remedy and the minimum number of doses. These latter principles will be discussed individually later in this article.

Inherent in Hahnemann's and other homeopaths' use of the law of similars is the recognition that symptoms are beneficent attempts of the organism to heal itself. Although maintaining this respect for the body's wisdom, Hahnemann was experienced enough in medicine to realize that the organism does not always heal by itself completely. Frequently, it needs some type of stimulus to its defenses in order to resist successfully potential illness or deal with present disease. Hahnemann noted that some type of medicinal stimulus via the law of similars was particularly important in chronic disease.

The wisdom of the law of similars is that it provides the stimulus to go with, rather than against, the organism's effort. The power of the *similia* principle can be recognized more clearly when one understands that it has a catalytic effect on the body's defenses that is significantly different from just providing another nutrient or serving as a metabolic inhibitor. This stimulation to the body's defenses is similar to immunizations, however, since a homeopathic remedy is chosen individually to the person based on the totality of his/her physical and psychological symptoms, and the remedy acts upon the individual's total defense system, not just upon the body's immunity to a specific disease. Also it should be added that the homeopathic remedies act not only as a preventive to disease, they act curatively when a person is already ill.

The law of similars without the use of the homeopathic remedies has also been described to be useful in psychotherapy (Hahnemann, 1835, pp. 49-50; Kent, 1979, p. 104; Whitmont, 1980). The *similia* principle, in part, lies within the psychological theory that affirms it is better for the person's health to express and become aware of emotions and attitudes than to ignore or suppress them. An example of the use of the law of similars in psychotherapy was described by family therapist Paul Watzlawick (1978) in a case of a child who sucked his thumb. Dr. Watzlawick told the boy and his parents that he should continue to suck his thumb, but that it is important that he give equal attention to sucking all his other fingers too. The child soon stopped sucking his thumb.

The question that is typically asked about the *similia* principle is: if the law of similars works, why does it work? This question may be impossible to answer. The only way to answer it may be the same way one answers questions about other natural law: because that's the way it is. Certainly, one can allude to physics research, biochemical research, or other natural science research (Barnard and Stephenson, 1967, 1969; Stephenson, 1955, 1960, 1961, 1966). However, no matter what is analytically described to be the reasons why the law of similars works, this analysis is secondary to the empirical observations of success or failure. The age-old and cross-cultural experiences of the law of similars by millions of professionals and laypeople should at least present the possibility of having some special effectiveness.

Whether one actually uses homeopathic remedies or not, the law of similars teaches us many lessons about healing which have philosophical and practical significance. It reminds us to maintain a healthy respect for the body's wisdom. It helps us to recognize the importance of expressing rather than suppressing symptoms (except in certain crisis situations that demand heroic measures). It shows us that certain therapies can do something more than increase or decrease specific metabolic functions, for the law of similars has a catalyzing effect on the human organism which stimulates its entire defense system to a higher level of order. These are some of the reasons why cultures, ancient and modern, have used the law of similars within and outside of healing. The law of similars is one of nature's laws that when used well can be one of our highest technologies.

## THE ENERGETIC ESSENCE OR SELF-ORGANIZING CAPACITIES OF THE ORGANISM

> "The material organism, deprived of vital force, cannot feel or act, or do anything for its own preservation. It is to the immaterial element, which vivifies it both in the state of health and in the state of sickness, that it owes the performance of its vital functions."
> Samuel Hahnemann

> "Self-organization is the dynamic principle underlying the emergence of a rich world of forms manifest in biological, ecological, social and cultural structures. But self-organization does not only start with what we usually call life." Erich Jantsch (1980, p. 19)

Traditionally, homeopathic literature has made reference to a "vital force"* that acted within and that animated the human organism. This vital force has a "formative intelligence" that is thought to unite the organism and endow it with the ability to react to all types of stress in the most efficient way possible. Distinct from other empirically based principles of homeopathic medicine, the vital force has been the homeopath's explanation of the organism's behavior and the rationale for how the homeopathic remedies acted.

Recent elaborations of systems theory by chemists Ilya Prigogine and Manfred Eigen, biologists Conrad Waddington and Paul Weiss, system theorists Erich Jantsch and Ervin Laszlo, and anthropologist Gregory Bateson have begun to describe the "self-organizing" capacities of the human organism and of all biological and social systems. The self-organizing characteristics of systems, like the underlying dynamics of the vital force, reveal the interconnectedness of all parts and the evolutionarily endowed self-renewing

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*Different cultures and different health practices throughout the world have various names for this "vital force." Some of these names are: *elan vital*, *ch'i*, *bioenergy*, *life energy*, or even "*The Force*."

**The homeopathic pharmaceutical process is called "potentization," which refers to a method of sequential dilution.**

and self-transforming capacities of complex systems. The self-renewing and self-transforming characteristics give the organism the ability to adapt to stress and to transform itself creatively to function with it.

In his book **Planet Medicine**, anthropologist Richard Grossinger said,

> "Vitalism and systems theory are both metaphors or models for the mysteries of nature. Some biologists and anthropologists even believe they are congruent and that the development of systems theory has eliminated the need for vitalism. It is seen as a more precise, elegant, and cybernetic statement of the same events."
> (1980, p. 117)

Despite the precision and elegance of the systems theory, some questions still remain in its explanation (or lack of it) of various paranormal events, including precognition, reincarnation, mediumistic phenomena, and the sometimes startling similar behaviors and lifestyles of twins who have been separated at birth and whose genetic endowment could not have created such specificity. These phenomena point to the possibility of a distinctive life force within each person which may not be just the synergy of their parts. Even if such phenomena as mentioned above are extremely rare, their occasional occurence may lead to evidence of a human soul or at least require systems theorists to integrate explanation for them within their conceptual framework.

Acknowledgement of an energetic essence within the human being has ancient roots, and some of the major scientists of Western civilization have devoted the majority of their writing to it. Grossinger reminds us of this past:

> "Kepler, Newton, and later the physicist Robert Boyle prove the twin meaning of the science of this time. It was angelic and numerological, but it also was objective and mathematical. When we, today, accept the laws of physics and chemistry as they come to us from then, we forget that we have streamlined them and burned off the magical (read: vitalistic) half." (1980, p. 126)

Whether one explains the universe and living organisms in vitalist terms or systems theory concepts, one still recognizes the value of healing practices that assess and treat a whole person acting and interacting within an environment. In homeopathy, the concept of psychosomatics as being unidirectional, where the mind generates bodily ills, is incomplete, since all symptoms affect and are affected by mind and body. Mental attitudes can generate bodily symptoms, and physiological changes can alter emotional or mental states. Homeopaths also consider environmental effects upon an individual's health. No matter how much a homeopathic remedy may stimulate a curative response, cure will be impossible if external stresses are strong and persistent. At the same time, however, homeopaths recognize that a person's health directly affects his susceptibility to outside influences. Thus, many normally pathogenic environmental stresses may have only negligible effects if a person's health is strong enough to resist them.

Vitalist or systems approaches also both tend to recognize the intrinsic wisdom of the bodymind's reaction to stress through the development of physical and psychological symptoms. Whereas vitalists may say that this reaction is a consequence of the vital force and its formative intelligence, systems theorists may say that it is a result of the self-organizing capacities of the organism in its efforts to create "order through fluctuation" (one of the primary principles of systems theory is that change/fluctuation occurs in systems as an effort to obtain a dynamic equilibrium). According to these perspectives, symptoms*, then, should never be suppressed through therapeutic or mental efforts except in dire emergencies. Homeopaths perceive symptoms as signs and signals with a meaning and with a homeostatic healing function. This understanding helps us to comprehend the value of the law of similars to go with, rather than against, vitalistic or evolutionary forces.

Vitalist or systems approaches also acknowledge the special diagnostic value in assessing the energetic levels (according to vitalist's terminology) or field phenomena or dynamic patterns (according to systems theorist's terminology). A vitalist may explain its value by saying that the energetic essence lies at the root of a person's being and thus its imbalance portends the way and the degree that the person may be sick in the future. Since it is known that matter is a condensed form of energy, learning about energy fields helps one predict how matter will behave. By analogy, learning about subtle flows of energy within the body may be valuable in predicting how health or disease will occur. A systems theorist may say something to the vitalist, however, instead of referring vaguely to energy, s/he would describe flow, fluctuation, vibration, rhythm, synchrony and resonance of physiochemical components and their ability to create harmony or disharmony within a system.

Vitalist or systems theories are each possible explanations for unknown universal laws, but their validation or refutation does not prove or disprove homeopathy. Investigation of these theories,

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*"Symptom" is derived from Greek and means "sign" or "signal."

**Homeopaths have found that not only do all the potencies have an effect but that the more a substance is potentized, the deeper it acts, the longer it acts, *and* the fewer number of doses are generally required in treatment.**

however, is still important in helping us understand the biological principles underlying homeopathy and in helping us determine how we can better utilize its valuable principles of healing.

## THE POTENTIZED REMEDY

The process that homeopathic pharmacies use to make their remedies is unique to homeopathy. The homeopathic pharmaceutical process is called "potentization," which refers to a method of sequential dilution. One part of a substance (plant, mineral, animal or chemical) is diluted (or triturated/ground, depending upon the substance) in nine parts distilled water (sometimes it is diluted with 99 parts or 50,000 parts distilled water and then labelled as such). This mixture is vigorously shaken at least 40 times, and then nine parts are dumped out and nine new parts of distilled water are added in. This dilution and vigorous shaking continues to as many times as desired. The standard levels of potentization include 3x, 6x, 30x, 200x, 1000x, 10,000x, 50,000x and 500,000x.

Potentization is probably the most controversial part of the homeopathic science because most scientists believe that any remedy over the 24th potency (24x) couldn't have any physiological effect since it is improbable that there are any remaining molecules. (in chemistry, Avogadro's number defines 6.023 times $10^{23}$ as the number of atoms theoretically contained within one mole of any substance. The 24th potency is $10^{-24}$ and thus there are few, if any, of the original molecules of the original substance.) Homeopaths have found that not only do all the potencies have an effect but that the more a substance is potentized, the deeper it acts, the longer it acts, and the fewer number of doses are generally required in treatment.

Indeed upon first thought this concept in homeopathy doesn't seem to make much sense. It would seem that the more a substance is concentrated, the more powerful it is. However, upon deeper contemplation of what the homeopathic dose is, one can understand the logic within this pharmaceutical process. Before discussing this rationale, it is important to mention that homeopaths do not pretend to know why the potencies work. Similarly, it should be noted that orthodox physicians today do not know why most of their drugs work, including those that are commonly used. Louis Goodman and Alfred Gilman, authors of the standard textbook in medicine on pharmaceutical therapies, once stated, "There are few drugs, if any, for which we know the basic mechanism of action" (1965). Homeopaths have, in fact, written eloquent biochemical and physiological expositions (Barnard and Stephenson, 1967, 1969; Stephenson, 1966; Boyd, 1967; Tiller, 1979) that describe why the remedies may act. But homeopaths tend to give much greater priority to understanding the results of the remedies rather than explaining analytically why they work.

Although the way the remedies actually work remains a mystery, vitalists and systems theorists can both describe this action from their own conceptual framework.

According to vitalists, explanation for the effects from homeopathic remedies is based upon recognition of the energetic essence of the human organism. With acknowledgement of this possibility, it is possible to imagine that a potentized

**A bell-driven triturating (pulverizing machine) from the Boericke and Tafel Pharmacy, 1895**

**The use of small doses to affect significant change is not new to medicine. A milligram of acetylcholine dissolved in 500,000 gallons of blood has long been known to lower the blood pressure of a cat, and even smaller amounts affect the beat of a frog's heart.**

"energetic" dose of a substance can affect the energetic essence of an individual. Further, it is understandable that the more a substance is potentized, the deeper it acts upon the energetic essence. Considering that the law of similars has been shown through immunizations to have catalyzing effect upon a person's immune system, one can then conjecture that the potentized remedy prescribed upon the indications of the *similia* principle can deeply stimulate a person's curative processes.

Systems theorists have not yet formally attempted to explain the action of homeopathic remedies. However, Stephenson (1966), homeopathic practitioner, researcher and theoretician, and Bernard (1967; 1969) have begun to postulate from this perspective. Such explanation makes reference to concepts from information theory, physics, and self-organizing capacities of nature. Principles of cybernetics and some new advances in pharmacology will also be discussed in helping to understand the microdose phenomena.

Stephenson (1966) has made reference to the work of the late Harvard physics chairman P.W. Bridgeman (1949). Bridgeman researched the effects of freezing water at various altitudes. He found that freezing water at higher altitudes created different ice crystallization patterns than at lower altitudes. Interestingly enough, he found that when he melted the ice that was frozen at a high altitude and then froze it at a low altitude the ice maintained the crystallization pattern of the higher altitude.

This research relates to discussion of homeopathic remedies by its implication for understanding the physical field effects on water without changing its material contents. Stephenson describes how the homeopathic pharmacological process changes the water (the solvent) and imprints it with the homeopathic remedy (the solute). The homeopathic remedies that are more dilute than Avogadro's number (the 24th potency and beyond) may thus still hold the template, pattern or information content of the substance without its chemical mass. This process may be similar to the DNA self-replication process where its hydrogen bonds are broken and the molecule ceases to be whole while still capable of passing on its vital genetic information.

The bodymind's genetic inheritance, its dynamic psycho-physiological feedback system and its sensitivity to the environment function like an elaborate communications system. The homeopathic remedy as pure information content can possibly act upon the information needs of the sick person. Since symptoms may be understood as the way that the organism seeks homeostasis and creates order through fluctuation, the informational efforts of the individualized remedy may help establish order in the organism. The law of similars then plays out its regenerating effects upon the self-organizing tendencies of the organism.

Cybernetics, the science of feedback systems of living and non-living systems, affirms that the interconnectedness and interdependence of a system's parts provide explanation for how macroscopic (large) changes occur from a minimum amount of effort. Such action is more likely to happen if the system is in a state of "metastable excitation," a hypersensitive state which is "cocked and ready to go" as soon as a specific stress or resonance triggers the avalanche effect. The low dose of the individually chosen homeopathic remedy may be enough to provide the triggering effect to the person's defense system which then leads to a curative response. Based on the above perspectives, both vitalist and systems theorists would probably agree with 15th century physician Paracelsus when he said, "not with the weight but beyond the weight should the drugs be administered" (1536).

Whether one believes in these explanations or not is of little significance. One does not need to believe in the existence of an energetic essence or the self-organizing capacities of an individual to use homeopathic remedies. Some homeopaths use the remedies just because they work. They have analogized this empirical approach to the fact that one does not need to understand or believe in gravity in order to make use of it or be affected by it.

With or without explanations for how homeopathic remedies work, it is clear that their presumed action profoundly questions many basic assumptions of mechanistic and reductionistic science. Understanding of the body and mind must now begin to recognize some interconnective pathways and synergistic forces withing the organism for which medical science today hardly has words or concepts. Although one might have assumed that the growing acceptance of acupuncture was going to revolutionize the medical profession's thinking of inner communication channels within the bodymind, explanations for why acupuncture works, however, often have been proposed in neurological or hormonal terms (as nerve blocks or as stimulators of endorphin release) rather than in defining new bio-energetic information pathways within the organism.

Also, homeopaths, who tend to be quite aware of the power of placebos, find that the remedies act with or without belief in the therapy or therapist. The growing number of physicians who are becoming "therapeutic nihilists" (skeptics of the therapeutic value of all pharmaceuticals) can thus

**Florey reported that pure penicillin will inhibit the development of sensitive microorganisms *in vitro* at dilutions of 1:50,000,000 to 1:100,000,000.**

learn and utilize some specific laws of healing from the homeopathic science.

The use of small doses to affect significant change is not new to medicine (Coulter, 1980). A milligram of acetylcholine dissolved in 500,000 gallons of blood has long been known to lower the blood pressure of a cat, and even smaller amounts affect the beat of a frog's heart (**Science**, 1930, p. 526). Florey (1943) reported that pure penicillin will inhibit the development of sensitive microorganisms *in vitro* at dilutions of 1:50,000,000 to 1:100,000,000. Another way of realizing the power of small doses has been by recognizing that the human body manufactures 50-100 millionths of a gram of thyroid hormone per day and the concentration of free thyroid in the normal blood is one part per 10,000 million parts of blood plasma (Evans, 1968, pp. 1493-4).

Past research on microdoses has not only been on humans; there have also been numerous experiments in the fields of botany, zoology, bacteriology, and physics (Stephenson, 1955). One interesting experiment was done by some agricultural scientists at Michigan State University. With the oil crisis in this country looming, Dr. Stanley Ries and his colleagues decided to look for an alternative to petroleum-based fertilizers. He extracted an alcohol from alfalfa and diluted it to the approximate ninth potency. One journalist referred to this dilution to be comparable to one jigger of vermouth to 800,000 gallons of gin (Perlman, 1977). Although Ries prepared this solution with a standard process of dilution rather than the specific homeopathic process, his experiment still is an excellent test of the influence and the power of the infinitesimal dose.

After spraying this diluted alfalfa alcohol mixture on experimental crops, he found that there was a substantial difference in their growth as compared with a control group and an unsprayed group of crops. Publishing his report in **Science** (1977), Ries cited that the treated tomatoes yielded 30% higher than untreated tomatoes; carrots were 21% bigger and fatter; asparagus plants produced 35-60% more, the sweet corn yields increased by nearly 25%. Ries' research also found that certain plants, especially rice, increased in both their growth and their protein content.

Although these small doses are not as dilute as most homeopathic potencies, the experiments indicate the sensitivity of certain organisms to specific substances. It is clear, however, that small doses of just any substance will not cause significant changes. Small doses tend to have a significant effect only when the organism or system has some specific sensitivity to it. Homeopathic medicine, as a scientific therapeutic, individualizes a very low dose of a specific remedy based on the law of similars in order to effect a deep catalyzing curative response.

New discoveries in pharmacology, biology, and biochemistry further help scientists comprehend the power of small doses. Recognition of the "biphasic effect" of drugs (the paradoxical effects of low doses of a substance being the reverse of what it causes in high doses) gives increased understanding to the action of homeopathic remedies (Coulter, 1980). Greater attention to the importance of biphasic effects may also help scientists realize that medicines may not primarily act upon pathological microorganisms or disease processes within the body. Instead, as homeopaths believe, medicines may act mainly upon the body's defense system which in turn suppresses the microorganisms or disease processes. This different way of understanding drug action will greatly change pharmaceutical science by encouraging the discovery and utilization of drugs that catalyze the body's defenses rather than those that "search and destroy" microorganisms or diseases.

Needless to say, the possibilities of using potentized substances in medicine, in agriculture and in numerous fields of study have hardly even begun. At a time in our society when resources are limited and concentrated doses of toxic chemicals abound throughout our environment, the use of small specially prepared non-toxic doses may be one of the most important discoveries in our time – both for the health of individuals and for the health of the planet. It is indeed reassuring to know that small is not only beautiful (á la Schumacher), but also that small is powerful.

## THE HOMEOPATHIC PROVING OF REMEDIES

"There is . . . no other possible way in which the peculiar effects of medicines on the health of individuals can be accurately ascertained – there is no sure, no more natural way of accomplishing this object, than to administer the . . . medicine experimentally, in moderate doses, to healthy persons, in order to ascertain what changes, symptoms, and signs of their influence each individually produces on the health of the body and of the mind." Samuel Hahnemann (1833, section 108)

"Hahnemann exercised a beneficial influence; he was the first to test systematically the effects of medicaments on healthy people . . . the experiments carried out by Hahnemann in the foundation of the homeopathic system stimulated newer detailed investigation . . ." Rudolf Virchow, "The Father of Pathology" (1858, pp. 54-5)

Drug experimentation by scientific medicine has been done either on animals or on sick people and usually in a laboratory setting. As Virchow notes, one further contribution that Hahnemann made to experimental medicine has been the experimenta-

**At present, the homeopathic *materia medicas* have much greater detailed information on the symptoms that various substances cause in overdose than standard toxicological texts.**

tion on healthy people. These experiments, called "provings," involve giving healthy people crude or potentized doses of a single substance on a daily basis until symptoms are elicited (usually within several weeks). Whereas a single dose or a series of 2-8 doses is all that is usually prescribed by homeopaths to initiate cure, daily doses of potentized remedies over many weeks are found to create a variety of physical, emotional, and mental symptoms unique to each substance. Typically, subjects in provings are given the 6x, 30x, or 200x potency of a remedy. If one is skeptical about homeopathy's use of potentized doses to cure people, one can easily be shown by provings that these remedies do in fact have a physiological and psychological action on people because they also have the power to cause a variety of symptoms when given in continual doses. It should be noted that symptoms from a proving can be alleviated by stopping the administration of the remedy.

The proving of remedies on healthy people is the homeopath's way of learning the specific set of characteristic symptoms a substance creates. Subjects in provings keep daily journals and are interviewed in order to amass detailed information that is then compiled in homeopathic *materia medicas* and *repertories.* The *materia medicas* are the books that list the materials of medicine used in homeopathy and that describe in detail the specific mind and body symptomology each substance creates in overdose. The *repertories* complement the use of the *materia medicas* by being a compendium of symptoms, listing the substances that cause each physical and psychological symptom. Since certain substances cause specific symptoms in greater intensity or frequency, the homeopathic books generally list the symptoms in this specific detail and use different typesetting styles (plain type, italics and bold face – in increasing order of the frequency in which the symptoms are caused by a substance).

The *materia medicas* and *repertories*, in a sense, are books of common law medicine, listing detailed information on what each specific substance causes. Although most of the provings were done in the 1800s and early 1900s, the American Institute of Homeopathy started a program of re-proving remedies in the 1940s but soon stopped this effort when they discovered that the remedies caused the same list of symptoms previously known. The books are as valuable today as when they were first published. More recently, homeopaths have tested through provings new remedies to determine their clinical value (Julian, 1979).

Learning what symptoms a substance causes in overdose has special value in its prescription. An individualized remedy can then be given to a person based upon the total symptoms a person has. Rene Dubos, Nobel Prize winning microbiologist, once noted the importance of sharp selectivity of medicines:

> "It is obvious that the sharper the selectivity of a biologically active substance, the greater the probability that it will be innocuous for cells and functions other than the one for which it has been designed. In other words, a substance is more likely to be therapeutically useful if it acts almost uniquely against a structure or an activity peculiar to the organism or function to be affected." (1964, pp. 38-39)

One example that is useful in helping us understand the value of selectivity of remedies is the medicinal use of bee venom for people with rheumatoid arthritis. It is folk knowledge that bee keepers very rarely get arthritis. It is also folk knowledge that people with arthritis have sometimes noted that their symptoms have disappeared or significantly decreased after they were stung by a bee. Recognizing the potential value of giving bee venom to people with arthritis, some medical researchers have begun experimenting with this medicinal substance (Buecherl and Buckley, 1971, pp. 465-6). Although nothing conclusive has been shown yet, from a homeopathic viewpoint it seems probable that the research will not find that bee venom is an effective medicine for arthritis. This hypothesis does not mean that bee venom is worthless in the treatment of arthritis; bee venom may be very effective in arthritis treatment, but only for a certain type of arthritic pain. Homeopaths have used bee venom (*Apis mellifica*) for over 150 years for a specific type of arthritis that has the characteristic symptoms of burning and stinging pain in the joints, swelling and sensitivity to heat, which are all symptoms bee venom creates in overdose.

The lesson that health practitioners and researchers can learn from this example is that we should not assume that any medicine can cure a specific disease, but rather we should more closely investigate which medicines may be effective in curing individuals who have their own characteristic symptoms of the disease. Such individualization will help create a more exacting and scientific health practice.

The use of provings may also be valuable in the field of toxicology. At present the homeopathic *materia medicas* have much greater detailed information on the symptoms that various substances cause in overdose than standard toxicological texts. Although homeopathic *materia medicas* do not have much information on many new man-made chemicals in which we come into regular contact, the procedure for doing homeopathic provings may be very valuable to researchers as a way of discovering side effects of chemicals without poisoning the experimenter's subjects.

**A homeopath would not prescribe one remedy for a person's headache, another for his stomach ache, and another for his depression. The homeopath tries to find the single remedy that creates in overdose the totality of symptoms the person experiences.**

## THE SINGLE REMEDY

Referring to most orthodox physicians' prescription of numerous medicines at a time, Hahnemann indignantly stated:

> "This motley mixing system is nothing but a convenient shift for one who, having but a slender acquaintance with the properties of a single substance, flatters himself, though he cannot find any one simple suitable remedy to remove the complaint, that by heaping a great many together there may be one amongst them that by a happy chance shall hit the mark." (1852, p. 499)

Research has shown that patients receive an average of nine different medicines during a stay in a hospital. The side effects of individual medicines are often startling enough, but the synergistic effects of numerous medicines together are frightening and unknown.

The use of a single remedy at a time is a basic principle of classical homeopathy. Usually a second remedy is not prescribed for one, two, or more months after the first prescription, except in occasional cases. Underlying the principle of the single remedy is the assumption that each person has only one disease. Despite the recognition that people have numerous symptoms from head to toe and one emotional or mental state or another, the homeopath assumes that people's symptoms develop from an underlying susceptibility of their unitary bodymind condition. To a homeopath, people's symptoms are but manifestations of a deeper process. The use of the single remedy then is to try to find the one deepest, most individualized, and most all encompassing remedy for each person. This remedy has the potential to stimulate effectively the person's natural defense system, not for just one illness but for all possible disease.

A homeopath would not prescribe one remedy for a person's headache, another for his stomachache, and another for his depression. The homeopath tries to find the single remedy that creates in overdose the totality of symptoms the person experiences.

The value of the single remedy in healing is that its use helps the practitioner and the client to know its effects. Knowledge about a remedy's effectiveness is important in homeopathy because it can influence further prescriptions a person is given. When remedies are mixed together, it remains uncertain which was effective. Another problem with giving a person two or more remedies is that when two substances are mixed together, a third substance is created which often has some characteristics of each of the substances and some characteristics which are new to the unique mixture. As such, its specific medicinal indications are unknown unless a homeopathic proving of this mixture is done.

The principle of the single remedy is a valuable concept in healing in general. One of the great problems within the holistic health movement today is that clients often participate in numerous therapies, some of which complement each other well, others which contradict each other, and still others that focus the person's consciousness on a health matter that is superficial to the heart of the person's problem. In essence the single remedy principle is analogous to the trite but true saying, "It is better to do one thing well than many things poorly." It is important for people involved in the new health movement to realize that a therapy individually may be very valuable to a person, but it may not be as effective when experienced with other therapies.

Some words of caution about the single remedy principle: that it is difficult to find the one most similar remedy (therapy) for a person. Also, one must always be on the lookout for possible obstructions to a person's cure, either as the result of something within his/her lifestyle or something within his/her environment.

## THE MINIMUM NUMBER OF DOSES

> "Nature uses as little as possible of anything." Johann Kepler, astronomer (1571-1630)

An essential precept within homeopathy is the principle of the minimum number of doses. When a person takes more than is necessary, the person experiences the subtle or gross symptoms of his/her defense system's efforts to eliminate the excess. Hahnemann strongly believed in the importance of this principle and affirmed that a person's inherent healing powers were so strong that only a small stimulus was needed to begin the healing process. Hahnemann and numerous other homeopaths have asserted that once the healing process begins it is very important to do nothing more and to let it continue. Another dose of a remedy may be indicated at some future time, but classical homeopaths are adamant about not prescribing another remedy or another dose until the first remedy has completed its effects.

Inherent in the minimum number of doses principle is the assumption that the purpose of medicine is to catalyze a person's innate healing process. This effort is different from the use of standard drugs which are prescribed to take the place of normal body processes (hormonal drugs), inhibit body responses (pain killers, anti-inflammatory drugs, antihistamines) or weaken or kill bacteria or cancer cells (antibiotics, chemotherapy, radiation therapy). All these do something to and for the body rather than stimulate it to heal itself. A side effect of treatments that do something to and for the body is that the body does not learn how to do it for itself as well. Also, such palliating and

**One healthy side effect that results from the minimum dose principle is that it discourages obsessiveness with treatment by clients or practitioners.**

suppressive treatments have little or no effect on the internal or external factors that created the problem in the first place. A further side effect of these drugs is that they tend to require larger and larger doses and sometimes breed addiction.

Drugs or therapies that serve as a catalyst to a person's defenses are significantly different from those that serve as a crutch to palliate symptoms. Treatments that catalyze the person's defenses sometimes increase the symptoms the person is experiencing in order to go with rather than against the inherent body wisdom. The law of similars plays a primary role in these therapies, and due to the *similia* principle's catalyzing effect, the minimum number of doses serves as the methodological imperative.

Although the differences between homeopathy and immunizations were described earlier, it is helpful in understanding the minimum dose principle that we discuss their similarities. Immunizations are an example of using the law of similars in a small (though not potentized) doses with a minimum number of treatments. The *similia* principle is the main characteristic of immunizations that makes this drug therapeutic distinct from others. Interestingly enough, immunizations are one of the few treatments within medicine today that stimulate the body's immune system. Also,as in homeopathy, further doses of immunizations do not build a higher level of immunity; in fact, too frequent repetition may create a series of side effects (in essence, they create a proving).

Acupuncturists, like homeopaths, have a respect for the minimum dose principle. One school of thought within acupuncture uses only one needle in a person per treatment. One of the leading texts in acupuncture practice asserts that it is important to use very few rather than many needles in treatment (Chinese Academy of Traditional Medicine, 1975, p. 280). The use of numerous needles in a person is thought to confuse the person's energy body.

One healthy side effect that results from the minimum dose principle is that it discourages obsessiveness with treatment by clients or practitioners. An important part of a definition of good health is that one be without addictions to treatment and not continually ruminating over one's sickness. The minimum dose principle encourages practitioners and clients to work together to find the best, most efficient, and deepest catalyzing therapy that will begin to get clients back on the road to health.

The minimum dose principle also has a value as one possible way to deal with many social problems. In particular, various types of welfare and foreign aid programs might find the minimum dose principle valuable if they sought to give more aid when it could be used to stimulate the person, the community, or the country to begin to do more for themselves. Welfare and foreign aid presently tends to breed a type of addiction and lack of responsibility similar to what results from medical drugs.

When using the minimum dose principle, one must remember that it is methodological tool that is only effective when the correct remedy, therapy, or solution is chosen. In homeopathy the incorrect remedy tends to have little or no effect, although a partially similar remedy can sometimes improve a person's superficial symptoms without affecting a person's core problem. The complications that result from a wrong prescription can then make it more difficult to find the correct remedy.

## HERING'S LAW OF CURE

> "If cure is in progress, symptoms will manifest at levels which are progressively of less crucial importance to the freedom of the individual to express fullness and creativity in life." Vithoulkas (1980, p. 231)

In orthodox medicine and even in most "holistic" health practices a person is usually evaluated largely on the state of the person's main complaint. This type of evaluation can create many problems because of its too narrow view of a person's health. For instance, a person with a skin condition may get treated with a cortisone creme or an herbal salve which may noticeably improve the surface of the skin but may drive this externalized complaint back into a deeper structure in their being. Although their skin may be improved, they may now have a more restricting and painful respiratory, digestive, emotional, or mental problem.

A holistic perspective to evaluating a person's progress towards health requires an analysis of all mind and body symptoms, which must be observed and compared over a period of time. Constantine Hering (1800-1880), the father of American homeopathy, recognized the importance of this perspective and noted through careful observation that there were three postulates of cure that described how one can determine if a person's health is improving or deteriorating. These postulates are called **"Hering's Law of Cure"** and are as follows:

1) **Healing moves from the deepest part of the organism (the mental and emotional states as well as the vital organs) to the more superficial parts (the skin, muscles, ligaments, and extremities).**

**A person's overall state of health according to a homeopath is defined primarily by his mental state, secondarily by his emotional state, and thirdly by his physical state.**

**2) Healing flows from the upper part of the body to the lower parts.**

**3) Healing progresses in reverse chronological order of the appearance of symptoms.**

A basic assumption behind these postulates is a definition of health that recognizes three different levels of a person's experience – the physical level, the emotional level, and the mental level. Health is defined as a state of freedom from limitation on any of these levels. The person thus experiences physical well-being, emotional centeredness, mental clarity and creativity. A person's overall state of health according to a homeopath is defined primarily by his mental state, secondarily by his emotional state, and thirdly by his physical state. Thus, a person with schizophrenic delusions with few chronic physical symptoms is generally considered by a homeopath to be more sick than a person who has chronic arthritic pain but who is relatively clear mentally and emotionally. There are of course exceptions to this general rule, for the major determinant is the degree to which a person's symptoms limit his/her freedom to live and act within the world.

Although Hering's Law of Cure is a very valuable tool in the holistic assessment of a person's health, it is not always the simplest tool to use in practice. Sometimes a person's symptoms seem to be externalizing, but they are going down the body and in reverse order of appearance. The important fact to remember is that these three postulates form one law and that these postulates must be analyzed by their relative importance in effecting the person's freedom to live.

According to the first postulate of Hering's Law, a cure generally is in progress when the inner symptoms (psychological and vital organ) lessen even if external symptoms (skin and soft tissue) increase (as long as the physical symptoms are not severely pathological). On the other hand, if a person's external symptoms improve but his emotional or mental symptoms increase, the person's state of health is thought to be worsening.

According to the second postulate of Hering's Law, a person is usually considered to be getting better when the arthritic pain in his neck has decreased although the pain in the finger joints remains the same. A homeopath would even consider the person to be progressing if the finger joint pain was worse than before taking the remedy. Such aggravation of symptoms on the distant extremities can be a good sign, especially when symptoms in the upper part of the body are improved.

The third postulate of Hering's Law is probably the most intriguing. Homeopaths frequently notice that their clients re-experience old symptoms from their past. Sometimes these symptoms were first experienced six months previously or perhaps even ten or twenty years ago. Frequently people re-experience symptoms that they had when they first developed their chronic condition. People sometimes also re-experience symptoms they have had treated previously with suppressive therapies. It should be noted that not every client re-experiences old symptoms, and not every person who re-experiences symptoms retraces every old symptom they ever had. Most frequently only a couple of symptoms recur.

The power of the homeopathic remedies becomes evident when one sees or experiences this retracing of symptoms. It is important to mention that during this recurrence of symptoms the person's mental and emotional state is usually much improved. Hence, homeopathic clients have frequently said, "Although my chronic__________ was like it was______ years ago, I wasn't as fearful of it and it didn't seem to bother me as much." Usually, these recurrences of symptoms only last a short time, often a couple hours or a couple of days.

Homeopaths are not the only practitioners who have postulated the existence of Hering's Law. Acupuncturists have witnessed aspects of this law for thousands of years. Naturopaths who guide their clients in long fasts and psychotherapists who lead their clients into deep psychotherapy have occasionally noticed this phenomenon too.

Hering's Law may have special value for health and medical researchers who are interested in evaluating holistic practices. Since it is inappropriate to judge holistic practices by only evaluating the progress of the client's main complaint, Hering's Law provides a framework to systematically assess the effect of holistic practices on individuals.

Homeopaths have described more specific information on Hering's Law than I have discussed in this introduction (Vithoulkas, 1980). However, the postulates require even greater detailed definition and testing. Once we recognize its present value and its future possibilities, research on Hering's Law will prove to be immensely important to practitioners, to researchers, and ultimately to clients.

## A NOTE OF CAUTION

As homeopathic medicine gains greater popularity in the coming years, it can be expected that practitioners will begin using the remedies with little or no knowledge of the principles of classical

Grinding fresh plants at the Boericke and Tafel Pharmacy in Philadelphia, 1895

homeopathy. Also some practitioners will not spend the necessary time with their clients to individualize the single remedy for them and will instead resort to prescribing numerous remedies for them.

Some practitioners will no doubt call themselves "homeopaths" when they've had little training or experience with this science. Some practitioners who use many therapies may begin to use some of the homeopathic remedies in their practice. Clients may assume that such a practitioner is a homeopath when it is not true. After some unsuccessful prescribing from such "homeopaths," some clients may think they have given homeopathy a chance and it didn't work.

These inevitable problems will result as more and more people become attracted to the homeopathic science. These problems can be greatly reduced by consumers learning some of the principles of classical homeopathy as discussed in this article and by asking practitioners for specific information on the type of homeopathy they practice. It is this author's bias that the teachings of classical homeopathy are profound and their clinical applications have been demonstrated over 180 years of testing. This doesn't mean that non-classical approaches to homeopathy aren't also effective; however, at present they do not have the same extensive historically tested principles of cure.

## FINDING A CLASSICAL HOMEOPATH

There are three questions that one can ask to learn whether a homeopath practices according to the classical traditions of homeopathy:

1) How much time does the homeopath spend with clients? (The initial interview should last 45 minutes or longer. Some practitioners may even ask the client to come back for a second visit before a remedy is prescribed. Follow-up visits can last between 30-45 minutes but can be shorter in certain circumstances. Ten or fifteen minute visits to a classical homeopath are rare, except in cases of injury [which are usually fairly easy to treat] and in minor acute conditions.)

2) How much attention does the homeopath give to the client's mental or emotional state? (A classical homeopath will seek to get details about the client's main complaint but will also spend much time asking questions about the client's mental and emotional state. One-third or one-half of the interview is commonly spent discussing emotional and mental symptoms.)

3) Does the homeopath recommend one or more than one remedy at a time? (A classical homeopath prescribes only one remedy at a time. Another remedy may be given in the future, but only when the first remedy has completed its action [ranging from a couple of weeks to a couple of months].)

## CLOSING REMARKS

In this article I have asserted, perhaps too boldly, that homeopathic medicine is a science. Indeed, homeopathy is not a "pure" science. Much research has not yet been done, and some of the homeopathic principles may not be testable. At the same time one can also critique orthodox medicine for not being a pure science.

It is not important to debate whether homeopathy is more or less scientific than orthodox medicine. It is much more important to determine if homeopathy deserves greater investigation by scientists, more educational opportunities for health care professionals, and increased access to homeopaths by the public. ■

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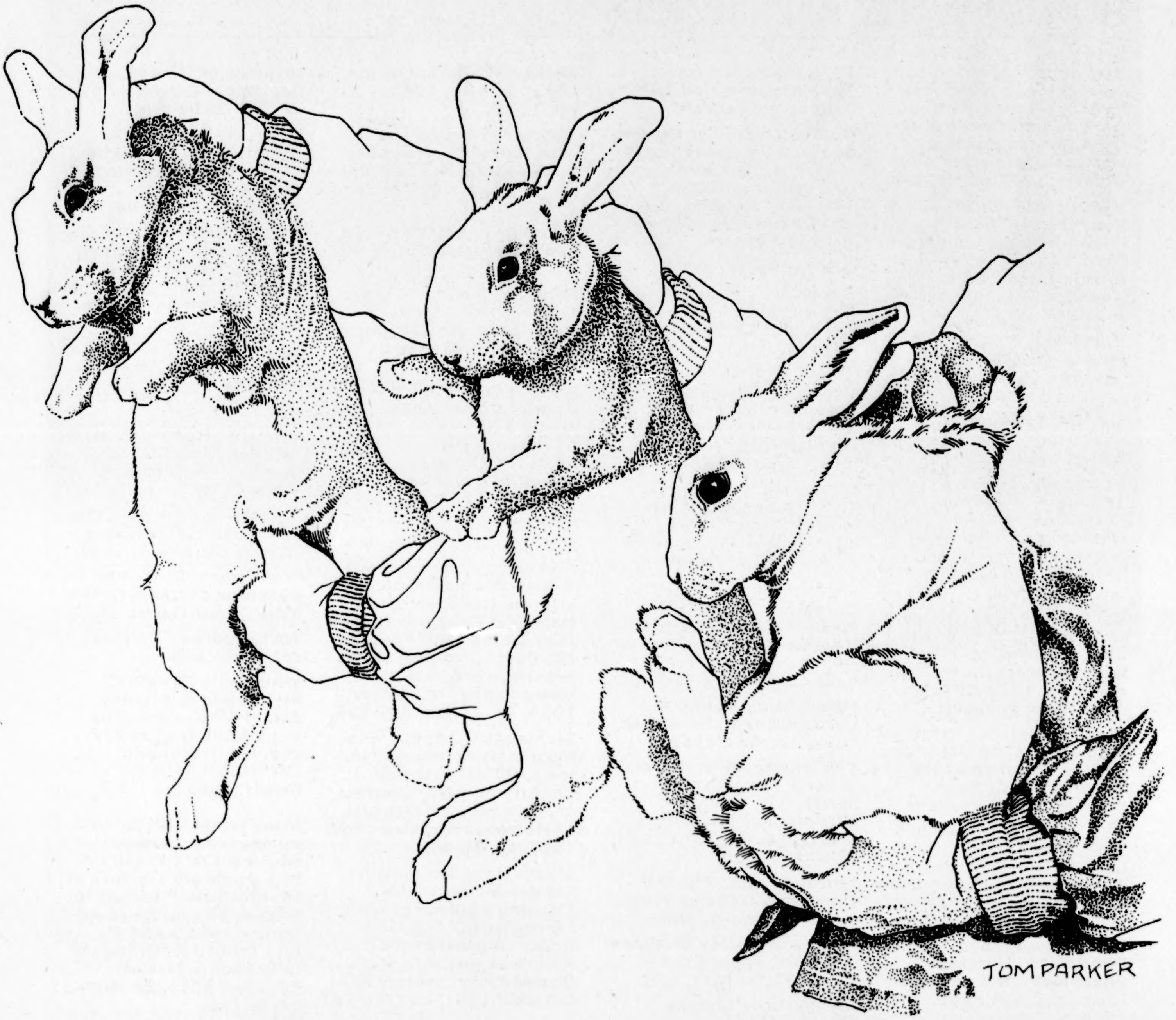


# Report from the Novice

by John Roberts

WE CALL THE RABBIT Young Guy, a husky male, not quite adult and stouter than average from an already purposefully stout parentage. A few times before, I have picked him up in my arms, carefully, so he and I would know this part of it, and so in this much, at least we would be together. But now I know the holding was not for him. It was for me, and it was an illusion of manners.

This time – in reaching, taking hold, lifting him out of the hutch – I know everything is different, and he must sense that. As I lift, his breath starts to come loud and fast and he grunts out suddenly, gravelly, a deep rattling in his throat. He lunges in my hands, kicks. Muscles bolt under his skin like spooked trout. I hold him straddled over my right arm, back legs away from me. Hard kicks snap in the air. Strong. Startlingly quick. Those legs lever curved claws that can lay a man's arm open.

My sleeves are rolled to the forearms. Bare flesh against fur. In this smoothness, I hope for a sign.

*The author defines himself pretty well in the story. The illustrator Tom Parker, who routinely gets our most difficult illustrating assignments, had this response to it:*

A couple of months back, I shot a deer with surgical precision from seven yards away. He didn't bolt; he didn't drop — with my arrow in his chest he hopped two feet, turned, and stared me in the face. I'd been watching this deer for a week or two, a nice size buck, but not too old and tough to eat. Enough meat to last us a year. There we were, a cold wet morning, twenty minutes into the season, just as I'd planned it. And there we stood seven yards apart, my quick, impersonal finish caught in a nasty pause,

"Hey you, did you just shoot me? Yeah, you, the one with the bow . . ."

We stared at each other, motionless, for thirty seconds before he wheeled, charged down a ravine and collapsed, leaving me alone with my bow still at arm's length knowing how it must feel to shoot a person in a hunting accident.

Animal eyes always baffle me. Their glittering, wall-eyed, ambiguous gaze reflects my uncertainty, makes me uneasy. —Tom Parker

My left hand keeps his head in place against my ribs. I can feel his front shoulder brace against my stomach, pressing tight warmth through, reflecting my own heat from the wool of my overshirt. His thrusts ease in the closeness, then stop, though he trembles. Slowly I loosen my left hand, begin to stroke him. Then for reasons I do not entirely understand, but perhaps to reach in to him, or perhaps to move forward through my own reluctance with some exacting cadence, I find I have started to hum – minor tones, a plain Aguado étude I have worked a long time toward playing on the guitar.

The rabbit's quakes slacken. They are not of cowering. There comes a truer, more elemental fear, a wide unknowing about the movement of one moment into the next. And I share it.

I REMEMBER HOW IN AWE I was when he was born, as though I had never seen anything born before. Birth strikes me like that. Fuzzle had delivered only two that time. I had worried something might be wrong. But the two were strong and grew fast on all the milk they wanted.

Young Guy's littermate grew in the quiet way of a thing almost wild. She developed soft gray ears and gray muzzle and tail, shades that all blended along indistinct contours into her dense white body fur like curls of fog, which she drew into when looked at too closely. My vision would somehow relieve her of form. The essence of Rabbit seemed to emanate without need of shape. Sometimes, I thought, this emanation rose from deep in my own mind – shadowy, like a sense of things lost.

I heed this mystery as I heed the memory of a moment just after dusk once when I walked by a cottonwood tree and the swelling dark released the silhouette of each knobby-fingered branch into the sky; and some crepuscular being of tree reached out, brushed one twig against the fine hairs on my earlobe, and I heard my name.

That's how it was with that rabbit.

I rarely saw her move. Mostly, she watched. When she did move about, it seemed she did so in an exercise of grace. She preened slowly, a sphere of gray mist, like the vapor of a breath revolving slowly in cold air.

I remember, though, how strong and tensile and full-fleshed the weight of that presence became when I was no longer able to put off the press of days and it came time to pick her up.

She was the first rabbit I killed with my hands.

I remember, too, my hesitation and how a piece of my heart broke away and communed straight out into time with the shatterings of some ancient bloodline when, within that hesitation, this always quiet creature arched in my hands, lurched, and gave one quick, sharply echoing squeal.

NOW AS I HOLD her littermate in my arms and walk away from the hutch, around the corner of my house to that place, I feel a throb wash through me, and I cannot say well enough how the charge in that first rabbit's voice has penetrated my soul.

The rabbit now in my arms grows calm, waits. His weight loosens over my forearm. I take a leather thong from my pocket and move to slip it over his left hind foot. He flinches, and I snug up the slipknot after missing once with the loop. In a moment, I must not miss.

I stop, feel the fine tight knit of his fur. The late afternoon is bright and cold after two days of snow.

I take hold of both hind legs just above the hocks with my left hand and let the cradle of my right arm straighten out slowly. My right hand slides from under the belly, to the chest, to the neck. Stretching head down now between the hand around his legs and the hand behind his head, he makes a curling adjustment, back to hips. He is heavy. I have waited long in thinking about this rabbit while things formed in my mind.

He is Young Guy, and I like him very much.

There is someone's advice to keep him for the buck. He is strong, his coloration striking – rich black ears and black satin muzzle that make you want to reach out and touch him and refrain at the same time, perhaps both out of respect.

He does things. The hutch holds new discoveries every day. He sniffs. Chews designs. He practices his scent whirl and hops into dances. Sometimes he stands up on his hind legs to look at things. And after I had taken his sister, I saw him grow into a steady bearing of poise.

There is also that echo in the bones of my ears.

But there is something else, the strength of growing, of becoming. This has been a time that has brought me much for which to be grateful. Wanting to touch everything, I hold back here alone in a place where prairie meets mountains, on the verge of some meditative yet peristaltic change that always seems promised in the opening of that aloneness. And here in the snow, just after winter solstice, on the arc toward wakefulness, I feel the rise and turn of every season, the resolve, the reinforcement, the direction, and the commitment to life that has even brought these rabbits, the gift of them, into my perspective. Such a time must be held seriously.

This rabbit's sire, a mysterious old silver-ear whose steady gaze holds secrets, is also liked. But that's not the point. There are no fair trades. Only trades. To go on, one risks – with the strongest.

I LOOK OUT ACROSS the snow, its light hold on the land. The rabbit is still. I feel for the indentation at the base of his skull and lodge my thumb. My fingers curve under his chin. These fingers that follow the Aguado etude on the guitar must now act truly to the music of the strings no one touches. There is this doing of hands and mind and there is this music. In between, there is one being of rabbit; and for any food to come from this with spirit and strength, all these things must come together in a precise moment and link my hands with the turning of the universe.

Gently, firmly, I bring the legs to my chest and brace my left forearm under my heart. I will not miss. I feel the pulse. I see the rabbit's spine relax and straighten. I see my breath in the cold air. The pulse. There is a moment between one breath and another.

I snap down sharply. The thumb pins the dislocation point and the motion pivots my hand, arcs the head and muzzle cupped in my fingers up, rotating up, spiraling up and back in a deadly simple articulation of wrist and spine describing the last limits of tautness on a curve. And somewhere on the curve, in the curving, two vertebrae part, and I hear the small rending of cartilage, a sound inside that cracks straight up through the bones of my arm and resounds through my skull, like one clean bite of gristle in the teeth.

Young Guy, be all right. Young Guy, please be all right.

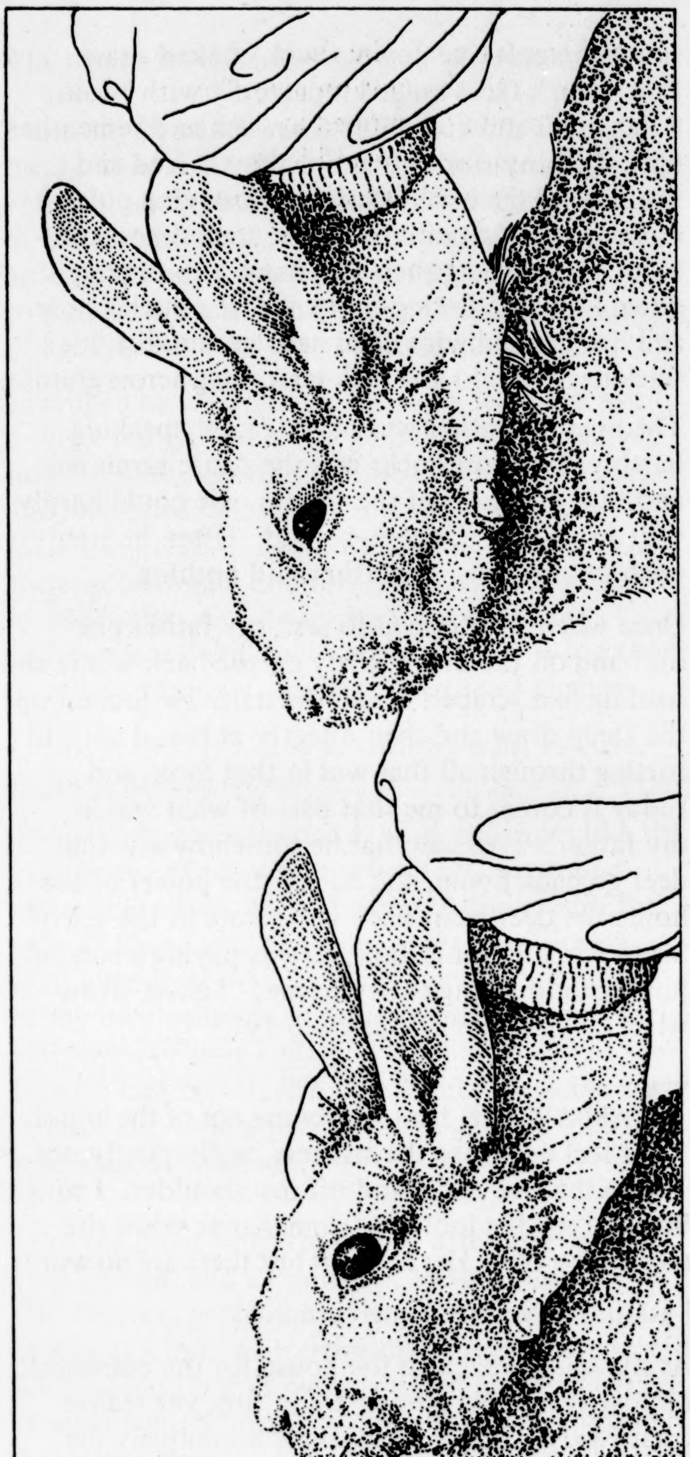
*They're so naked and pink when they're born. And there were only these two to curl up together in the cold. Here, rustle down in this straw and these cottonwood leaves. Keep these wisps of doe fur over you. Your fur will come. Here. Be warm. Be all right.*

Things must be right. Must be right. I step to the eastward-canting side of the cottonwood tree where I have two hooks in the trunk. My steps have no weight. This movement toward the tree is a float. Some rising presence begins to swell in the air like a held breath. The shocked rabbit, from reverberations of leg tendons and fine bones stretching down from my hand, hums through me and out and around me, an enveloping sacred resilience, alive as a tone loosed from a tuning fork.

From around the base of the tree I have scooped a clearing free of the twenty-two inches of new snow from the past two days and nights of steady sifting. This is where I must stand, beside where the cottonwood comes out of the ground.

I tell myself to keep moving but not to rush. Thoughts flood; I remember in scooping out this place earlier – the snow disturbed till then only by the smoothly drifted-over trough where the big racked mule deer buck stood last night – I had let the corner of the shovel scrape down to dark earth, damp black like a wound in the snow. The angular dig-end of this opening I had covered back over with fresh powder, had feathered it out with the toe of my boot. The curving sweep at the lift-end of the mark had pleased me. I had left it. Now, even in my acceleration, this slower time enters my mind. The earth was well present in this mark, I thought, firm under the cleared spot's remaining snow mat. It was enough. The land still spread out under the snow from this place. Things must not be laid too bare.

Moving quickly now I loop the leather thong over one hook in the cottonwood. The trunk leans toward me out of a slope and lets the rabbit hang straight down. I place the big bowl underneath and take the wooden handle of the knife in my hand. I have put these things out in advance,



carefully laid them out within reach to be used one after the other.

There is no sound. But something is building. The pressure of that deep tone now is huge in the air. It is then that I see his eye, the wide, expanding, liquid consciousness. A live eye.

I reach out with my left hand, feel his ears come into my palm, close my hand around them. My right hand brings the blade to his throat. In the hum there comes a palpable shudder. I draw the knife, feel the first slight slip of fur then the clean sinking cut. Electric spirit-flight explodes. Young Guy tries to arch up! I tighten, draw the knife again. He kicks. Kicks again, hard strong kicks. Blood. Ears tight in my hand. I hold against his twist, press in, feel the blade edge draw into neck bone. A jolting kick grates it, jerks hands, flesh and steel almost apart. He's so strong! The eye. Wide. White around. Gray-footed claws dig into tree bark – tense, slip, dig again. Blood falls out in thick red sheets. Möbius curves of red, dark red, separate in the air and splash the bowl, the tree, the snow. I hold the knife to go deep. Deep with his strength in it. He pushes beyond seizures now, slowing, tensing urgently in this giving over of muscle to some yet stronger moment, stronger even than the will now unclenching and bursting from his heart. It is with the power of that eye that he pushes.

The knife edge finds the joint. Sleek liquidy draw. Thick blots on the snow. Then the dark red runs evenly. I feel its warmth on my hand. A swelling disorientation overtakes me as the knife passes through the last holding tissue and my two hands disconnect from each other, come too free in the air.

Stillness. The snow. Something pouring. A white openness pushes back everything around me. The furred body hangs limp. I tell myself to go on: start skinning, start dressing and cleaning. But I am stopped, struck by the wonder, by the presence pouring into the air between my hands, by the ongoing strength of it, and by the call rising in me to stop and step back in the surge. Inhaled dissolution slips with oxygen into my lungs and holds deep in my chest, waiting there, hinting at me, rich with the terror of stopped breath.

I do not know what should come next.

The sun seems to slow, then wait. It holds me in white light. I have leaned over in moments similar to this before, struck by what has gone out of a curled leaf, a staring eye. I have felt the aloneness. But this hold seems so new; this chilled time includes me.

I can only stand in a scooped depression in the snow.

No one has taught me. No one has told me of this moment, of its growing inside a man, of its dark feeding on years of things seen and felt, and then of its pushing and laboring, of its rising up out of the man, born like a huge dream. I have come into this doing alone. Deep realizations come to order in their own way, slowly, and perhaps late, but now they are coming and they bring me to stand here, wondering into the most secret primal folds of my being – in one hand a knife, in the other a head.

Wide tundra of sky. Fear. I feel deeply afraid of following this life I have now loosed into the air, of the opening of this presence. I am trying to move carefully and with respect, but in matters of this extreme communion, I am not an expert. I am a learner. And the perception rises in me that some things of grave consequence and some of wonder and beauty cannot be learned without guidance.

I search the openness for instruction. The white openness.

How much foam, how much more unconsciousness, must I struggle up through? Here is the eye. And here is the silk touch of fur on the ears. And here is the presence of Other, this huge pouring in the air, and the waiting of all.

Into mind comes what I have felt before from the first rabbit and what I have felt from other animals, alive and dead, and from the ones I have killed in other ways and seen killed years before. Slippery liquid recollections, blood clues, inklings, trace revulsions, thick solutions of marvel, and the washing and washing of droplets from scent glands flush forward from my memory and flood me in waves. Hot fermentation.

Senses lift away. The objects of the world loom and swell out of their lines, ease into curves and wave forms like shifting snow drifts. Somewhere across this landscape, I know, hovers my own rhythm. And I know that if in this perception I cannot find the next careful step across these slopes the presence waiting here will enact a judgment worse than anger. It will simply turn away from me and be gone.

How do I acknowledge what waits for me here? What do I do, put his head on the snow?

I wince in the shame of my small, small knowledge of these things.

I remember hearing accounts from tribal peoples who are still mindful of what inhabits moments like this. Some of them sing. I once met a man who put grain down before the mouth. I am grateful for these thoughts. But they are not mine. I find myself reaching my mind out to these others, needing to feel the meaning of their acts.

I remember once when my father helped a man carry a big deer out of steep country. The rugged slopes funneled us down a rock-choked draw. Both men's faces bulged repeatedly with strain. I was small and couldn't help much and remember how tight my stomach got as they hefted and shouldered the buck, slung on a carrying pole, down off and around boulders, sometimes stumbling and scraping their free hand or bumping down heavily on a hip or a knee, the buck's nose and lips crusted with dead needles and dirt, his thick neck flaccid, the rack scratching across granite.

The man my father was helping kept speaking harshly about the rocks and the dense scrub oak and the roughness of the terrain. He could hardly wait to get out of there, he said. Often he tried to push on too fast. My father said nothing.

Once when we stopped to rest, my father put his hand on the deer, lightly on the back where the hauling had scraped off all the hair. He looked up the steep draw and then directly at me. I am still sorting through all that was in that look, and today it comes to me that part of what was in my father's eyes was that he somehow saw that deer go back home, and he saw the power of the home the deer went back into. And in the act of his touch and of his look, he was paying a sort of homage and trying to say to me, "Listen. Now what do you hear of this country?"

I AM AWARE Lanie has come out of the house. I feel her sense the stillness, walk quietly out to the tree and stand off my shoulder. I turn and see the look that comes over when she regards my face. Her lips part but there are no words.

I ask her to get me some cornmeal.

As she hurries back to the house for the cornmeal, I know again how alone I am in this, yet realize what vastly strung relationships accompany me, invite me, lead me.

I put the knife down. I place the head on the ground where the scoop mark of earth meets the snow. I walk to the door and wait for Lanie to bring the cornmeal. She brings it cupped in her hand and pours the ground corn from her palm into mine.

When I return to the place by the cottonwood I am still unsure of how to proceed. I go down on my haunches near the head, then rest one knee on the snow. The rabbit's eyes are still clear, terribly clear. I reach out with the corn in my hand and suddenly it comes to me that my small understandings of this rabbit, the character he expressed, his antics, the promise of his being, and the beauty I scarcely could hold in my arms and in my mind, are only part of what makes me love him. The rest comes from something larger, something I would sometimes see hints of in his eye and which now fills the eye completely and goes beyond my understanding.

The eye holds the composure of pure wildness.

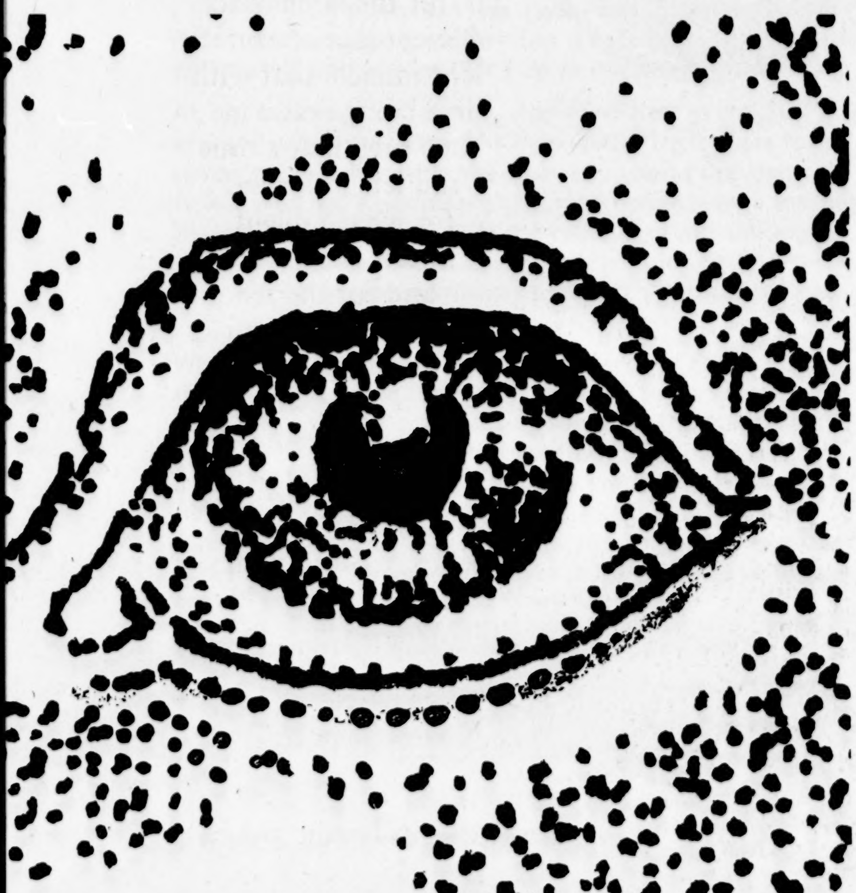
I turn my hand over and begin to work the cornmeal out in a thin stream. With this stream of pale yellow grains, I make a single loop spiral in front of the muzzle and continue in a wider arc once around the head, leaving the end of the spiral open to fade into the snow. I do not know why this design has come to me. I do not question it.

The open arc of grain on the snow leads my eye to a single red globule. The globule rests in a tiny bowl of white crystals sculpted by its first heat and weight of falling. Its surface now appears smoothly frozen. I pick this small lobe from the snow with thumb and forefinger and bring it up to look closely. As I do so the form melts and disappears and my thumb and finger come together on exquisite liquid, the very texture of change.

I look at the eye. It is so strong I want to cover it, but I do not.

There is change all around, huge and quiet like the giving over of momentum from sky to ground after a big snow. It is like that, I think, with the cells of blood and bone and nerve, reaffirming their alignment. As I crouch here, the vibrations of my own cells are working on me as surely as the vibrations of time rolling in the Earth. And I see: It is for this rabbit, this "domestic" creature, to initiate me, to bring me just this glimpse into the teachings of wildness.

Like the quiet which has come after meeting the eyes of Deer and Coyote and Raven, encounters still evolving in my mind, it is this Rabbit who comes as a link, who strips me of expectations and whose blood brings me this touch between beings through which I might go on, might learn truly from the others.



The cold melt of some snow soaks through the cloth on my knee, and I realize I still have half the cornmeal left in my other hand. I get up and walk around the corner of the house to the rabbit hutches. I open a hutch, reach in and brush the cornmeal into the food bowl of the six-weeks-old litter of four – into the circular bowl.

*I come to you in the turning with food. You come to me in the turning with food.*

I step back to look at the rabbits. In a moment, with surprise, I find I have taken a lick of remaining corn granules from my palm.

I think I must be in the vapor of some high craziness. But there is the spiral in my mind, and that part is right. I have found a ritual, and it is not ritual that makes craziness. Yet in looking at this cluster of rabbits in the hutch, I feel something askew.

What had been in that eye does not live in a hutch.

There is much work to be done with this thought, but already I feel a burn rising in the recognition of my having accepted some wrong line through the spiral, a human mistake thousands of years old. The mistake has grown unctuous in this kind of easy acceptance of it, deep-rooted in the convenience of one person after the next accepting it on a larger and larger scale, and it has been passed down as this idea of keeping animals in cages, breeding them for cages.

Among my acquaintances are people who have others do all their killing for them, as I have had others do. These people will ask me about the matter of killing. I know their anguish. In many ways I share the tragic removal of responsibility for and the wrong placement of that anguish. These people are not insensitive. They will ask me about the killing. But they will not ask me about the cages, nor about the much larger, much more crowded pens and cages supported by the other way of doing things; nor about what is lost from the eyes of the animals that come into us from cages, and thus what is lost from our own eyes; nor about the idea that in that way it is we who are caged.

We think ourselves fortunate. If we wish, we can distance ourselves from all this with tools – a hatchet, a gun, a slaughterhouse. We are the only ones. All the other creatures of this Earth take the strength of life straight across, feel it fight and give over in their jaws.

I have other friends and family who for a long time have taken the responsibility for their food and have lived with what that means and with, I imagine, deeper subsequent discoveries. I think of them now, think of the strength that has come into their faces from their own learnings, and of the presence of mind they must possess to go on without callousness.

I walk back to the tree to finish my work.

Steam rises from the body when I pull the skin down and away. He is a big rabbit. The wet weight of the skin pulls heavily on the stretcher I have made of nine-gauge wire, and the skin slides off and must be held with clothespins. My next stretcher will come from a split branch of willow.

My fingers get cold, stiffen; and after opening the pink nakedness even more, I hold the steaming entrails in my hands for warmth. He gives so much.

It is dark when I finish.

HEART AND LIVER go to humans, lungs and, this time, kidneys to the cats. The offal I carry to the open finger of land to the south and put under a ponderosa pine for some wild creature.

The snow is deep in the field, and I pause for a moment by the pine before making my way back. I step out from under the boughs and look up. Immediately to the west, the Flatirons jut into a tightly packed, starless bank of charcoal black clouds, a background of darkness which gives the escarpment the appearance of leaning over me. Directly overhead and churning upslope from the east roll low cloud makings of lighter fog, gray-white in the luminescence reflected off the snow, wisps like the fur a rabbit doe pulls from her chest for her young, releasing the blink of a star here and there, then the moon, and moving on up and dissolving in the dark.

WHEN I GET HOME I let Moyen, one of the two cats who live with us, out the back door, and an extraordinary thing happens. Lanie and I watch him lower his head and trot straight out to the cottonwood as though he's after something, cued by a detected vulnerability of prey so wide it has outstripped his usual caution. Moyen is a young cat.

There is still blood on the snow, but Moyen starts looking back and forth at something in the air. Then he stops. I see him sniff something and freeze. He takes a careful step backwards, then his tail puffs up. He turns and runs, almost sideways, light-footed and dizzy-looking, back to the house. We let him back in, but the hair on his tail does not lie down for a long time.

FOR TWO DAYS, the rabbit body rests in a cool place. On the third day, I take it to the block, cut it apart, and put the pink-white pieces into a marinade of safflower oil, spices, and brandy. They steep in the dark. Sometime in the night, Rabbit endows meat.

In the evening of the following day, Lanie browns the pieces in a black cast iron fry pan, sautés fresh onions and mushrooms with bacon, and adds this along with light touches of bay leaf, thyme, garlic, parsley, and burgundy to the marinade. The rabbit cooks in this sauce on low heat for an hour and a half.

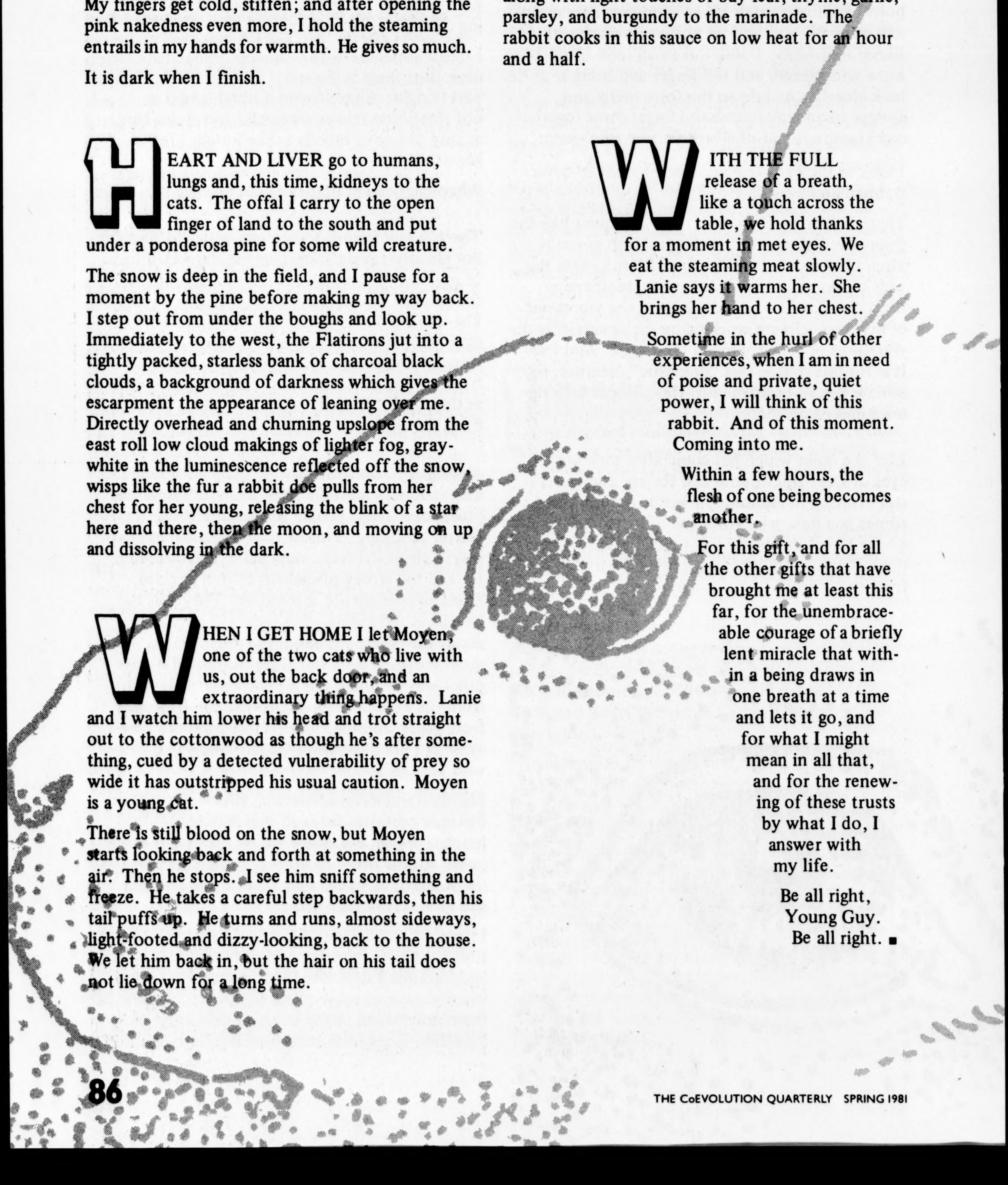
WITH THE FULL release of a breath, like a touch across the table, we hold thanks for a moment in met eyes. We eat the steaming meat slowly. Lanie says it warms her. She brings her hand to her chest.

Sometime in the hurl of other experiences, when I am in need of poise and private, quiet power, I will think of this rabbit. And of this moment. Coming into me.

Within a few hours, the flesh of one being becomes another.

For this gift, and for all the other gifts that have brought me at least this far, for the unembraceable courage of a briefly lent miracle that within a being draws in one breath at a time and lets it go, and for what I might mean in all that, and for the renewing of these trusts by what I do, I answer with my life.

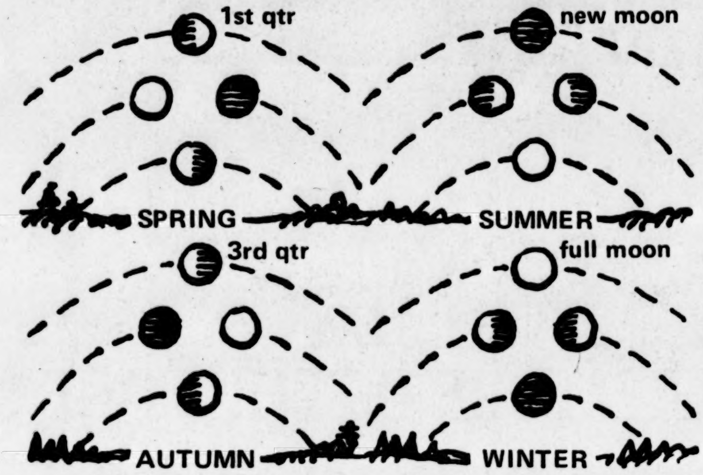
Be all right,
Young Guy.
Be all right. ■



## Why the moon shines brighter on snow

Dear **CQ** Bay dwellers —

Here's a gee whiz obvious observation that seems to surprise a lot of folks, even those who've spent time at the ocean and thought they had the Moon's phases all figured out. I didn't see it myself till I lived in a cirque deep enough that I didn't see the Sun from November to February or the full Moon all summer. Namely, the Moon, in its monthly passage along the ecliptic, does the same up-and-down dance in the sky (monthly) that the Sun does (yearly), and different phases are highest at different times of year:



. . . Which is another reason (besides the whiteness of the snow) that full Moon nights in winter are so bright and summer nighttime hikes under the full Moon don't go so well in thick woods. The effect (18° to 64° above the horizon at my latitude) is every bit as pronounced as the seasonal Sun changes.

There is an aid to interpreting diagrams like this one when you need to tell 1st quarter from 3rd quarter (this is from an old Scandinavian farmer in Rolvaag's **Giants in the Earth.**) If you can cup your right hand around the half Moon's curved edge, it's on the wax; if you have to use your left, it's on the wane. I haven't checked the old calendars to see if they actually draw this correctly, though I suppose they knew what they were doing in those days. Have you noticed how fewer and fewer calendars these days bother to show the phases of the Moon?

I find Rolvaag's criterion less useful in actual practice than just knowing that the moon is waxing if it's up in the evening and waning if it's up in the morning.

At the full Moon, of course, the Moon rises as the Sun sets and vice versa. One of Kazantzakis' translators (can't remember which) makes the interesting point that demotic Greek even has a word for the phenomenon where the full Moon rises in the east while the red Sun is still sinking in the west. It's worth a climb up a ridge or a trip to the Midwest (or an ocean voyage) to adjust your horizons so you can see this occasionally.

What else? Oh, yeah, it's also news to us in the interior that the Moon, like the tides, comes up just about an hour later every day. So if you look out the door this winter, see that high bright Moon on the snow beckoning you to strap on those skis and take off through the woods but — gee, I dunno, I'm feeling just a bit tired, maybe tomorrow night. . . . Just remember, it'll be an hour later and tireder tomorrow and maybe blizzarding to boot, so get off your ass and get out there NOW!

By gosh, maybe I will! (I'll get back to you later.)

Your good round friend's friend,

Gary Miller
Pullman, Washington

## Shadow Work

*The Summer 1980* **CQ** *carried three essays by Ivan Illich, "The Three Dimensions of Social Choice," "The War Against Subsistence," and "Taught Mother Tongue." Though difficult, they were apparently illuminating, because an unusual number of readers responded to them. This new book has the three plus two more, "Science by People" and "Shadow Work."*

*From energy to medicine to schooling to, now, vernacular values, Illich changes minds.* —*SB*

**Shadow Work**
Ivan Illich
1981; 152 pp.

**$5.95** postpaid from:
Marion Boyars, Inc.
Merrimack Book Service
99 Main Street
Salem, NH 03079
or Whole Earth
Household Store

●

The essays gathered here deal with the rise of the shadow economy. I have coined this term to speak about transactions which are not in the monetized sector and yet do not exist in pre-industrial society. With the rise of the shadow economy I observe the appearance of a kind of toil which is not rewarded by wages and yet contributes nothing to the household's independence from the market . . . (it is) a necessary condition for the family wage earner to exist.

●

While for wage labor you apply and qualify, to shadow work you are born or are diagnosed for. For wage labor you are selected; into shadow work you are put. The time, toil and loss of dignity entailed are exacted without pay. Yet increasingly the unpaid self-discipline of shadow work becomes more important than wage labor for further economic growth.

## World Energy Data Sheet

## World Food System Data Sheet

*These 2' x 3' sheets make it easy to find basic numbers on energy and food production and consumption world-wide, country by country. They'll save you hours of messing around at the back ends of dozens of obscure (and boring) books, and they're big enough and handsome enough to have up there on the wall where you can't forget. Trends, lack, bloat, and potential disaster can be seen all too well. Dymaxion maps on the reverse side of the sheets show you where things are happening. From the henchpersons of Bucky Fuller.*

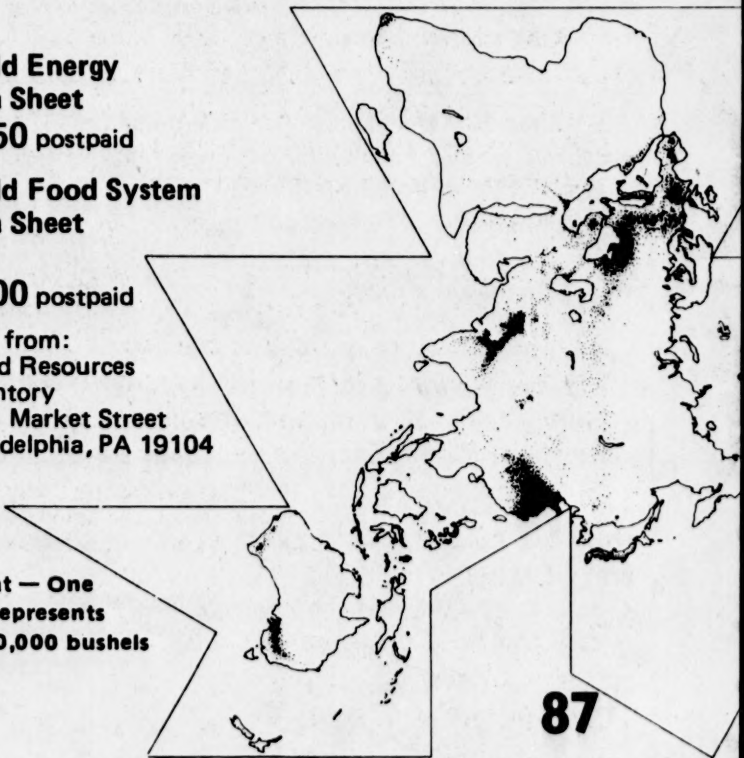
—*J. Baldwin*

**World Energy Data Sheet**
**$3.50** postpaid

**World Food System Data Sheet**

**$2.00** postpaid

both from:
World Resources Inventory
3501 Market Street
Philadelphia, PA 19104



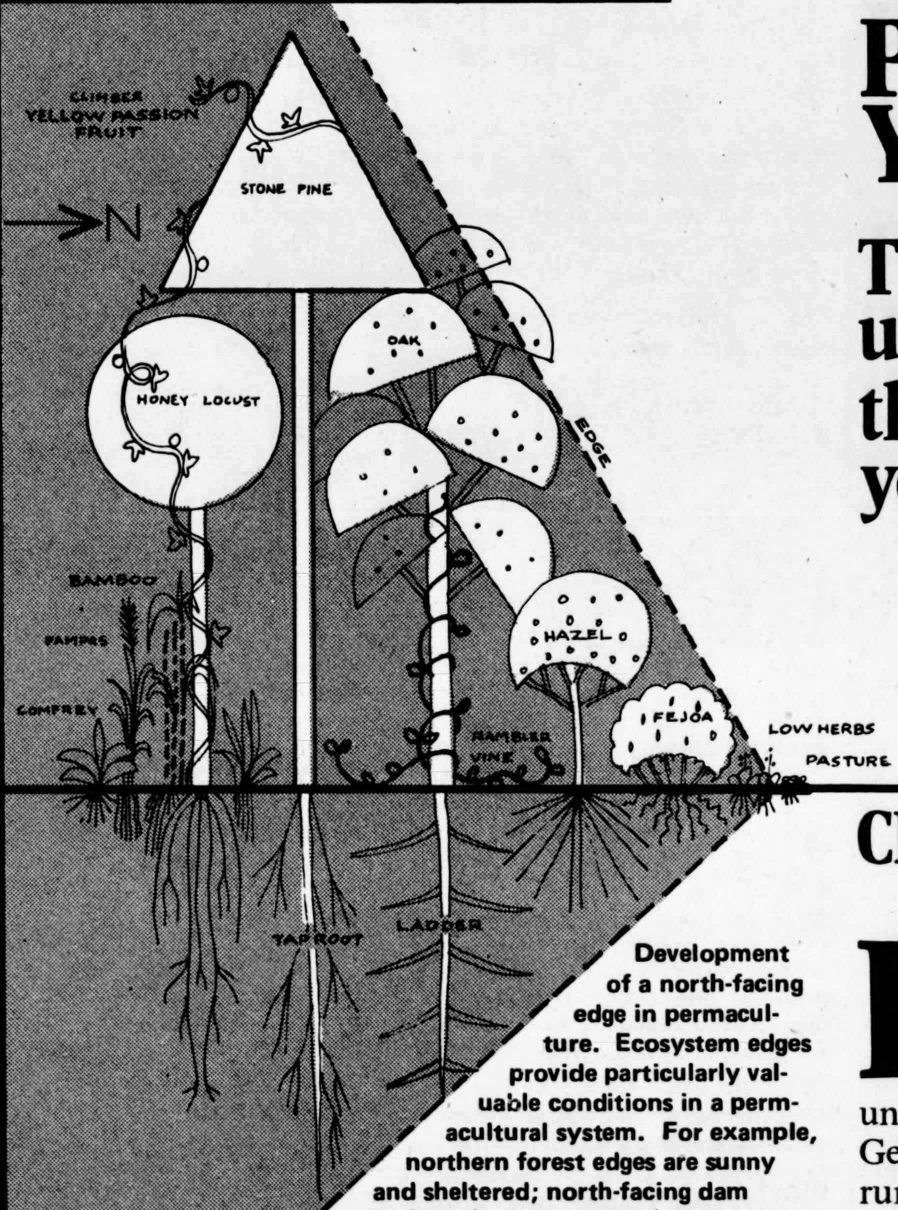
**Wheat — One dot represents 1,000,000 bushels**

## LAND USE

# PERMACULTURE YARNS

by Bill Mollison

## The more you understand, the less you need.



**Development of a north-facing edge in permaculture. Ecosystem edges provide particularly valuable conditions in a permacultural system. For example, northern forest edges are sunny and sheltered; north-facing dam walls (land/water interface) have seepage which is very valuable to species needing warm conditions and plentiful water — such as some bamboo species; marsh areas (land/water interface) allow the development of whole systems of useful plants; hedgerows and dense barriers (open country/dense vegetation interface) provide habitat for many species of animals.**

**In view of the edge effect, it seems worthwhile to increase interface between particular habitats to a maximum. A landscape with complex edge is interesting and beautiful; it can be considered the basis of the art of landscape design. And most certainly, increased edge makes for a more productive landscape.**

*Australian Bill Mollison is the author of* Permaculture One *and* Permaculture Two, *reviewed on p. 83 of* The Next Whole Earth Catalog. *Few landscapes are considered too marginal for permaculture, which aims to design "cultivated ecosystems" based on a useful diversity of indigenous, self-renewing plant and animal species managed by people living there. Mollison is a founder of Tagari, an intentionally amorphous family legally structured as a multinational corporation and centered in Bill's hometown of Stanley, Tasmania.*

*These anecdotes, opinions, and yarns I transcribed from five hours of taped talks last spring. Eventually* DUMP HEAP *(2950 Walnut Boulevard, Walnut Creek, CA 94598, subscription $6/year) will release the yarns in complete form. —Jamie Jobb*

## CREATURE OF THE EDGE

EDGE IS A NATURAL STRATEGY. You may design a good lake, then looking at the edge of it, you can make lake-forest, lake-mown, lake-unmown, lake-earthbank, lake-gentle slope. Gentle slope runs into the lake, shallows run to shallows, cliffs run to shallows. Each one of those you break up defines a completely different niche with a completely different set of conditions.

As you pass from one environment to another, from forest to water, you have species that were in the forest, species that were in the water, all meeting on the edge. And on the edge, everywhere, there's always species of the edge.

Mankind is a species of the edge.

He never occurs in any natural fixed condition of ecology. You won't find man spontaneously occurring in a stable ecology. He's always on the edge of the lake, on the edge of the glacier, on the volcanic surround. Where the tides rise and fall, where fluctuation occurs, man occurs. So as you're a creature of the edge, it's the edge you build in (to your permaculture design). That gives you the highest yield.

See people struggle to find the natural state of man. Was he in the forest? Was he swinging down from the trees? Did he get on his feet and go out in the plains? Did he

# MULCH THE CAT

FEW PEOPLE OUTSIDE our small Tasmanian circle had heard of "permaculture" five years ago. At the end of 1975, when I was going to Victoria for more aboriginal work, the Royal Melbourne Institute of Technology said, "Will you lecture on your plant system while you're here?" And I said, "Sure."

So I went in and they were really smitten by it. They said "This is bloody fantastic, have you got it written up?" I said, "Sort of . . . not really."

"Could you do ten minutes on the radio for us, then?"

I said, "Yeah," and went on for ten. The people in the ABC (Australian Broadcasting Commission) were disinterested. "Some other bloody garden freak." But the switchboard jammed up! And they said, "For Christ sake come back, we'll fly you over for an hour-and-a-half talkback." I did . . . and got nine thousand letters.

In the ten minutes, I just said very simple things. Like "It's possible to grow a nice little forest that you build of many different trees, each of which is edible. Grow a little food forest, it will keep you forever. If black birds come in, eat them! They're part of your crop."

And I said all these other weird things they had never heard of. "Mulch your cat. Because it's eating your frogs and your lizards and they were controlling your insects. Now that's why you've got so many insects in your garden. And you don't need to dig it, just throw some paper down and strew some straw on top of it. In a couple of hours you can do a quarter-acre." And I said, "If we did that in and around our cities, we could produce our own fuel and food. There's no energy crisis. There is only a lack of confidence in ourselves."

get his broad flat fingers and go into the ocean to turn over rocks? And we say "Yes, yes, yes . . . always on the edge!"

Never out in the sea, never in the center of the forest, never right in the middle of the plains, but along the river, along the shoreline. Just plot the cities. Just plot your non-failed communities and you'll find them sitting on an edge.

The edge through suburban open space is often more productive than the city or the farm land. In Australia we have a figure for that. Suburban land has a 28 percent higher productivity than the farm and of course a lot more than the city proper.

So it doesn't necessarily mean that because you cover an area with widely spaced suburbs that you reduce the productivity. You may actually increase it. What's more, you'll increase it in a lot more ways than the figure shows because much of the transport cost is abolished.

Suburban family farmers are the salvation of the world!

# NEXT TO NOTHING

(WE SAW AN EXHIBIT recently which had native people from all over the world. In each land, we saw a complete picture of how they lived, their tools, their landscape. What was striking about the Australian aboriginals, other than their lack of structures and clothing, were their tools. These seemed to be just tiny stones and sticks to the untrained eye.)

What nobody really understands is the extraordinary sophistication of that system. Let me give you the aboriginal ethic: the more you understand, the less you need . . . in terms of changing material objects around, in any way.

So with an ethic like that, you would seem a complete idiot if you thought of inventing a motor vehicle, because you would understand very little about anything.

The real aboriginal hero is the person who can slowly walk, absolutely naked on Earth. And yet everything comes to him.

So even chipping a rock is a bit unnecessary. That's something you just quite don't understand there!

So you can see how what you're looking at is the product of the most sophisticated thinking society on the Earth.

## FAT DREAM

TOO MUCH ENERGY made us very sick. We stopped inventing anything and that's a fact. It's only when we needed it that we bring the old brain into gear. Energy makes you sleepy, you sort of doze along. It's like having a good fire and too much to eat. You just can't think. You just kick off and sort of grow fat and die in a dream. Lots of generations have just lived in that fat condition, died in dreams really.

I mean nobody is ever defining sanity but they're always defining insanity. With a lot of external energy you don't have to do anything. So you're insane. Total insanity is totally not doing anything, not having to do anything. And that's why society can get very sick on too much energy. So like other forms of power, you should govern it to just what is enough. And people are enough, that is the whole point.

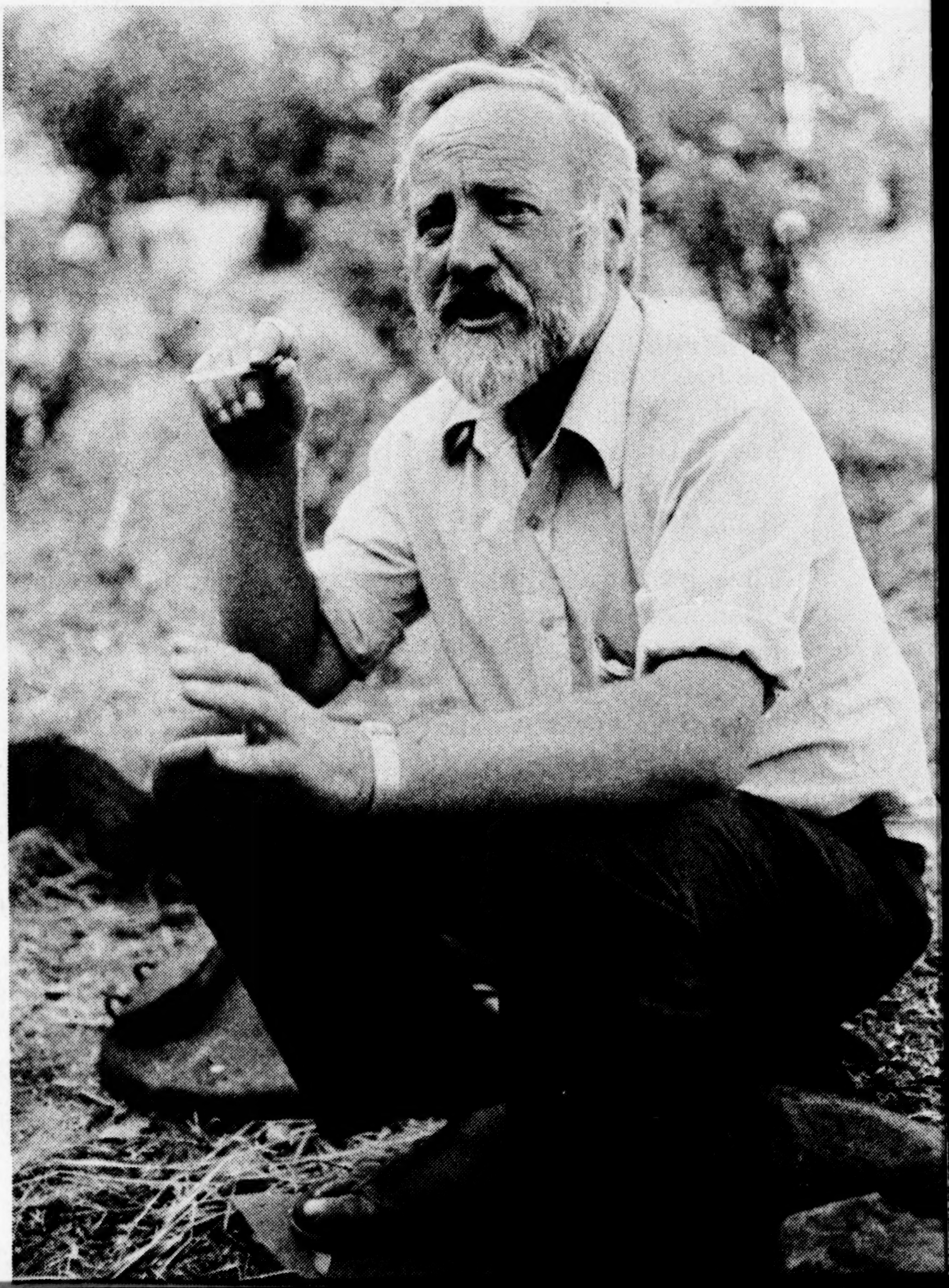
Now I believe that while we go round being inventive, the little things we invent are going to make the big differences. That's been true all the time. Nobody ever invented a giant-sized anything. They always made it on the bench in the kitchen. And if you leave it on the bench in the kitchen, that will really change the world.

## VERACITY

YARNING IS A GREAT EVENING occupation around the fire or on the boat. Then you sit down and listen to the old fellows tell their funny stories. And when you get to the early 30s, you're allowed to tell a few yarns too. But it's a real skill. It's got to be absolutely, properly done.

I'll give you the structure of a real classical Australian bush (or sea) yarn. First, you tell a truthful thing which is improbable but, if pressed, you can prove. Then, everybody sits quiet for a while. And finally someone tells a yarn that sounds almost as probable but is palpably impossible, thus destroying the veracity of the previous speaker and bringing the bloody house down!

Here's a classic sea yarn. Not long ago I



JAMIE JOBB

**Bill Mollison**

went out with an old friend on a boat. He's now very successful and owns a large fishing boat. We're old friends and we don't need to fish. We've got plenty fish for the day. And here we were in the evening, us old fellows, all the young blokes were exhausted. We're still up, talking fish. Finally, I said to him:

"You find a lot of funny things in shark, mate."

"My God you do, Bill."

I'd set the scene. He knew I was about to tell him something strange. So I waited a while . . .

"Yeah. I was in the middle of Bass Strait once and caught a female shark. I gutted her and there lay a book of matches." That is the truth. That actually happened to me.

My mate sighs and looks in the water a long while . . .

"Funny you should say that," he finally says . . .

"I went out near the Metzcycle Light the other day and we caught a big white pointer. It had a bit of a lump in her, and I said to the boys 'What's that?' So I cut her open and said, 'Me Christ, it's a ship's riding light.' "

You know, this big brass thing. And I said "Uh oh!" and he said,

"Yeah, that was bad enough, but even more peculiar," he said, "it was still alight!"

We paused for a while and listened to the sea. I knew he had destroyed my bloody story! So I said, "you're a bloody liar!" and he said,

"Yes, well anyhow I'll tell you what. If you don't strike one of those matches, I'll blow me light out." ■

## Permaculture journal

*Permaculture is a new term (permanent + agriculture, meaning perennial plants, lots of trees, low maintenance) for an old idea. As old as nature's ecosystems. J. Russell Smith wrote about it in* **Tree Crops** *50 years ago. These folks — including Bill Mollison — are doing and writing about it now in Australia. Produce food by manipulating plants and the spaces they live in, not by mining the soil.*
*—Richard Nilsen*

**Permaculture**
(Journal of the National
Permaculture Association)
Terry White, Editor
**$10** /year (4 issues)
from:
Permaculture
37 Goldsmith Street
Maryborough, Victoria
3465 Australia

PERMACULTURE

●

*Alice:* Geoff, you're showing people that it's possible to raise huge animals and grow subtropical crops without any form of artificial input. What is the secret?

*Geoff:* Air. Air in the soil. This creates conditions for earthworms and soil micro-organisms to grow and make good healthy topsoil which grows healthy plants. Mr. Average Farmer today kills many worms by tipping the soil up the wrong way and spreading highly acid superphosphate over badly compacted hard pastures — makes the worm's job much harder!

He's fighting Nature, not working with it. The land here is like a big sponge. Any rain that falls soaks straight in, and doesn't lie on the land surface to be evaporated or run off. And that's 'cos there's air in the soil.

●

We have come up with a sure fire, minimum labor method of producing a good organic potting mix. First, fence off an area 3m x 3m for your chooks [chickens] (20 will do) let them eat off the weeds and scratch up the seeds and grubs for a week or so, then cover the area with 75 mm of river sand. It may be possible to buy second grade which has lumps of charcoal in it (after bushfires) this is excellent. Then cover this with 75 mm of sawdust, preferably hardwood but pine is OK. Next let the chooks in and continue to add any short fibred organic waste, e.g. lawn clippings, vegetable scraps, shredded newspaper etc. In a short few weeks your chooks will have produced nearly one cubic metre of beautiful organic potting mix.

For your seed trays sieve through a fine sieve and add one part of the resulting powder to 10 parts of river sand.

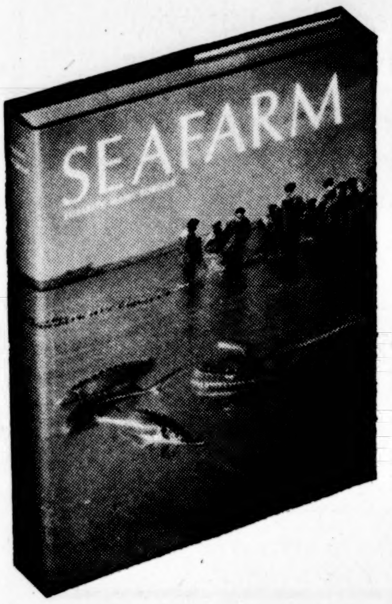
'Bill Bullock' weighed in last year at 3040 lbs. He grew up on pasture that hasn't had super for 20 years. (Pivot Phosphate Co-op recommends 1 cwt/acre of superphosphate for grazing properties in Geoff's area.)

## Seafarm

*In order to be a long-term ecologically stable means of food and energy production, aquaculture needs to be woven into a marriage between available renewable resources and the environment in which it is practiced. The most efficient and economically sound practice has evolved in the "developing" countries of Asia and the Far East, where direct involvement has created a philosophical understanding of relationship to the surrounding environment.*

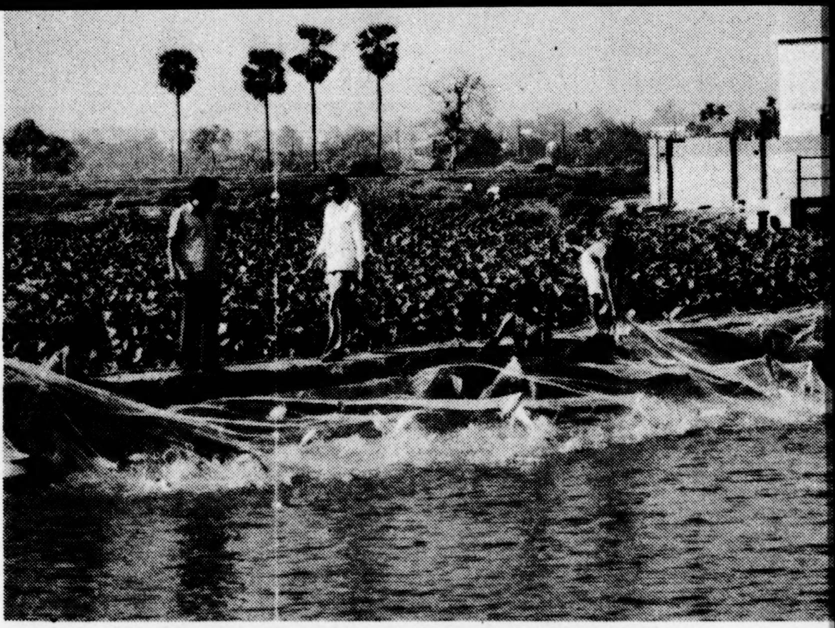
**Seafarm: The Story of Aquaculture** *presents intimate tales of historical as well as current ecological aquaculture techniques and their practice from the ingenious methods of the rice paddy fish farmer and the science of the marine biologist to the development of guidelines for global aquaculture. It is rare to find a book this beautiful and informative.*

*—Ron Zweig*
*New Alchemy Institute*



**Seafarm**
(The Story of Aquaculture)
Elisabeth Mann Borgese
1980; 236 pp.

**$36.50** postpaid from:
Harry N. Abrams, Inc.
110 East 59th Street
New York, NY 10022
or Whole Earth Household Store



Netting carp, tilapia, and catfish on a fish farm integrated with a sewage purification plant, near Calcutta, India.

●

That aquaculture has a philosophical base in the East and a scientific base in the West has far-reaching implications. In the East it is culture, it is life: culture to improve life by providing food and employment. It is embedded in the social and economic infrastructure. All that science can and must do is to make this culture more effective. In this respect, the East has much to learn from the West. In the West, aquaculture is science and technology, embodied in industry and providing profits: money. It has no social infrastructure. The economic infrastructure has yet to be created. In this the West has much to learn from the East.

It is on this meeting, this merger, that food for the world and peace for the world largely depend.

## Horticultural Management of Solar Greenhouses in the Northeast

*Recipe for a great teaching manual:*
- *Visit 20 first generation solar greenhouses in the northeast.*
- *Talk with the owners.*
- *Distill their experiences into wonderful simplicity — especially the mistakes.*
- *Bind with a plastic ring so the book lies flat when open.*

*—Richard Nilsen*
*[Suggested by Chris Winne]*

**Horticultural Management of Solar Greenhouses in the Northeast**
Miriam Klein
1980; 95 pp.

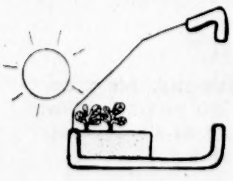
**$5** postpaid from:
The Memphremagog Group
P.O. Box 456
Newport, VT 05855
or Whole Earth Household Store

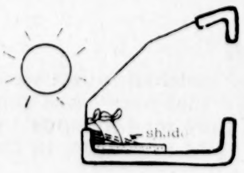
●

(1) Avoid watering on dull cloudy, rainy, or snowy days. On those days, very little transpiration (plant giving off water vapor) is taking place and humidity is likely to be high. Don't add to the humidity by overwatering plants.

(2) Water early in the morning so that the leaves have a chance to dry off by the time cool evening temperatures set in. Wet cool leaves provide the perfect environment for molds and mildews.

**Kneewall Shading: If your greenhouse is built with a solid kneewall, be sure to bring your bed or bench right up to the level of the glazing. If the bed is below the glazing level, the front portion of the growing area will be in the shade.**





## Ecology Action of Midpeninsula Self-Teaching Mini-Series

*John Jeavons, in his book* **How to Grow More Vegetables** *(NWEC, p. 96), translated Alan Chadwick's etheric biodynamic double-dug garden "method" in terms for backyard application. To address common questions that popped up since publication of the book, Jeavons and Palo Alto friends began this series of booklets for people seeking to employ themselves as market gardeners or working to influence agricultural science and public policy with statistical clout. Incidentally, the Common Ground garden where Jeavons' group made many observations and experiments has been lost, but they're confident of finding a new site.* *—Jamie Jobb*

**Ecology Action of Midpeninsula Self-Teaching Mini-Series**
John Jeavons,
J. Mogador Griffin, et al.
1980; 8 - 64 pp. ea.

**$8.75** (set of 6 booklets) postpaid

(No. 1, Cucumber Bonanza, $1.75; No. 2, One-Crop Test Booklet: Soybeans, $2; No. 3, Self-fertilizing Herbal Lawn, $1.25; No. 4, Food From Your Backyard Homestead, $2.25; No. 5, U-Bar Booklet, $.75; No. 6, Beginning to Mini-Farm, $3.25; all postpaid)

Price list
**free**
all from:
Ecology Action of the Midpeninsula
2225 El Camino Real
Palo Alto, CA 94306

Ecology Action
Beginning to Mini-Farm
Ecology Action
SOYBEANS

## Honest Business

*Innovative and practical are not contradictory, merely seldom met with together. The reason this book is full of small business advice which is both innovative and practical is that it is primarily reporting — anecdotal material from the Briarpatch, an entrepreneurial network in the San Francisco Bay Area with a wealth of gentle success behind it. Michael Phillips has been in the thick of it since the beginning in the early '70s. Here is the full body of what he has learned and been teaching.* —SB

**Honest Business**
(Superior Strategy
for Success)
Michael Phillips and
Salli Rasberry
1981; 180 pp.

**$7** postpaid from:
Random House
400 Hahn Road
Westminster, MD 21157

or Whole Earth
Household Store

•

In comparing the qualities of the successful small-business people we counsel with those whose businesses fail, we see a consistent pattern. Usually the person who successfully starts and runs a small business either had a parent or close relative who had a business or, in a few cases in which the parents were not the source, they had significant business experience themselves before the age of eighteen.

The children of taxi drivers, greasy spoon restaurateurs and dentists have a very good chance of succeeding in business. Children of teachers, bureaucrats and soldiers don't. A child who worked in her father's drug store selling sodas, or in his mother's bookkeeping office doing ledgers, has a good grasp of how business works and can respond, intuitively, to business advice. All the unspoken, invisible issues of business are subtly communicated to children, and no amount of schooling can fully take the place of that process.

•

Going slow is the most rational strategy for starting and running a business. It means paying close attention to your timing, planning openings and expansions so they reflect market needs and knowing that major changes will take longer to carry out than you expect. Most of all, in an ongoing business, it means making small, incremental changes that allow you to wait and see the effects of each change. The mistake of making many simultaneous changes means that the successful ones cannot be isolated. Such mistakes can be serious because small errors in judgment can have major consequences.

•

On one end of the spectrum of supervisory styles is the collective with consensus decision making. Although the terminology is recent in American business and the concept seems frightening to many traditional managers, consensus decision making is the norm in Japanese business and is currently being tested and adapted to our culture. Good Times Graphics is a collective of eight people that has been operating for more than a decade, and which grossed more than $300,000 last year. New Games is another collective of ten people, that is over five years old, with over $600,000 in annual revenues from their training programs. Fort Help is a health clinic with over twenty-five working members that has done well for more than a decade. All three are true collectives which we know personally that have thrived. In a consensus supervisory environment the structures of operations and responsibility closely parallel traditional businesses — there are bookkeepers, office managers, salespeople, etc. — but the decision-making process is different. Often you will find that managerial responsibility is rotated as are jobs entailing drudgery.

## Credit Where Credit Is Due

*If you have been sufficiently non-participatory of mainstream economics long enough, so that when you eventually went down to the local bank and told them you would like a credit card because you were travelling next month and thought it would be handy and the man behind the counter looked at your jeans and embroidered blouse and said that the bank rarely gave credit privileges to single mothers without savings accounts, this book will tell you that that man is breaking the law. Although I don't recommend getting into hock, the fact is that the country is switching from cash to cards, and it is getting more and more awkward to live without them. Recognizing this, recent laws have made credit virtually a right which cannot be denied without good reason. If you are denied for bad reasons, this is a good book to fight back with.* —Paul Hawken

**Credit Where
Credit Is Due**
(A Legal Guide to Your
Credit Rights and How
to Assert Them)
Glen Walker
1979; 198 pp.

**$6.15** postpaid from:
Holt, Rinehart
and Winston
383 Madison Avenue
New York, NY 10017

or Whole Earth
Household Store

## "Black culture is getting a deserved rest . . ."

Black culture is not on hold as SB's preface (**NWEC**, p.4) would lead us to believe. Maybe his perception is colored by the fact that black culture is equated with male black culture. Female black culture is alive and well and even making news. Organizing efforts by black women, for instance, in Louisiana and through the Frank Porter Graham Center as well as other labor organizing schools, are in fact revolutionizing the movement to develop community farms and appropriate technology for communities in the South. This is important because it has been projected that by 1984 black people will have lost (mostly by shady means or inability to pay taxes) 90% of their land, most of which is in the South.

As for literary culture. A lot of black male writers think that black women should not be feminists. But it is through this awakened feminism — not necessarily political — that great writing by black women is now being published and read. The unearthing of Zora Neale Hurston's writings was a literary event of the last two years. Hurston not only inspired many of today's black writers, but her research into the complexity and roots of black culture (under Franz Boas when she was in academia) has not been equaled since. She studied "folklore" with an emphasis on first-person oral transmission and medicine. Her novel, **Their Eyes Were Watching God** (1978; $4.95 postpaid from University of Illinois Press, 54 East Gregory Drive, Urbana, IL 61801) is an elegant, slow sketch of real life with a woman telling it. It's true, black women today are not writing about the same things as their male counterparts, and they are in fact ruffling their feathers. Hurston ruffled feathers of the likes of Richard Wright and Langston Hughes in the '20s. They disapproved of Hurston's way of living, loving, working, and looking at the world. She couldn't get grants or help to continue writing after she became "controversial." She went to work as a maid, died a few years later and was buried in an unmarked grave. People today who are aware that black culture is not resting are reading Alice Walker, Toni Morrison, Toni Cade Bambara, June Jordan, Audre Lorde, Ntozake Shange, Nikki Giovanni, and Zora Neale Hurston — not Huey Newton and Eldridge Cleaver. This is a significant change. It means something is going on.

Peggy Beck
Taos, New Mexico

# "Secretary"

*by Margaret Conway*

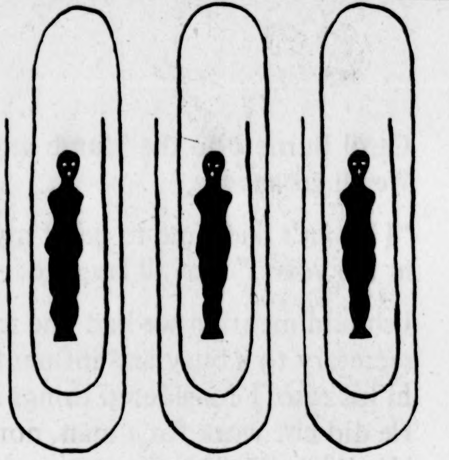
THIS IS A STORY to be read around the fire on National Secretaries' Day. I wonder if any secretaries take that holiday seriously. Its approach always gives me the uncomfortable feeling that another year is over, though it occurs in springtime.

One day last spring my boss presented me with a large bouquet of flowers. I like flowers. "What's that for?" I asked. "National Secretaries' Day," he beamed, "for an excellent secretary!" My mind took a quick tour back over the years – boxes of candy, bouquets of flowers, one large scented candle, and the many, like distracted husbands, who forgot. In a way, I blessed the ones who forgot. Yet I am not ungrateful, and I love flowers. Somewhere on this tour my mind was brought up short. Had it really been so? With the advent of this holiday and the large bouquet, I could not hide from myself the fact that I had indeed worked as, called myself, been a secretary for 20 years.

What does it mean to be a secretary? I needed and still need some perspective. I was then working in a large city hospital. In the course of my work I had every day to call other doctors' offices. Always I got the secretary who, like myself, was

May 7, 1981
SUBJECT
REGARDING PERSONNEL
ATTENTION
MEMORANDUM
CONFIDENTIAL
TO:
Board

B.S. BEAVER



busy screening calls. I never saw these women, but I had come to recognize their voices so that, before they identified themselves, I could say "Hello Maria," or "Hello Allison." One had a high nasal whine (sinus trouble?); another's voice was throaty and resonant (self-assured, I speculated); another was so soft-spoken I had to ask her to repeat the message. I didn't think too much about these women; their voices punctuated my work hours. Viewed romantically, they are the efficient guardians of the inner sanctum of the medical profession (that is, they take the heat off the doctors). I realized I was probably just a voice to any one of them. There we sat in our tastefully decorated cubicles, guarding our sanctuaries, isolated from one another.

So I did something different. I organized a meeting. My voice approached voice after anonymous voice. I chose, by instinct (I had no objective way of knowing a voice's age, yet I *knew*), women who were 35 or older and had been secretaries for longer than they perhaps cared to remember. I am not an organizer nor a committee person, and I was pleasantly surprised each time someone showed enthusiasm and said she would come. "What's it about?" they asked. I could not say. I could only tell them the dynamic of the group would determine the content of the meeting. "Is it about unionizing?" they asked. I said no, that wasn't what I had in mind. The solution seemed too simplistic. Solution to what? I could not even tell myself what I meant. I said I was writing a story about a secretary and needed some input. (The story is about a secretary's inner life, the troubled consciousness of a woman who is out of touch with herself and her work. I believe it accurately expresses the mood of frustration, the inability to break out that most of us who do this work have sometimes felt.)

We met at the cafeteria of a nearby hospital, chosen because it was smaller and quieter than our own cafeteria. I would wait for them in the lobby. I didn't describe myself nor did they. We trusted we would know each other, just as we knew each other's voices on the phone. One after another they came in. We greeted each other in the shy, tentative way of those perpetrating a minor crime. We sat up straight, picked at our food; there was an intensity, an ambience of intrigue. Everyone soon warmed to the occasion. *What was it?* Wherein did our dissatisfaction lie? Our wages — we all agreed they were inadequate, and yet . . . . Were our bosses brutally insensitive? In most cases, no. Unions? We had all seen enough of unions in our families or in the media to realize they might solve the problem of our inadequate wages, but would they *legitimize* us? It was at this point the conversation took a peculiar turn.

"Actually, I'm not really a secretary anymore. I manage the whole office and have a very responsible position."

"I'd say the same about myself. For several years I've been more an office manager than a secretary. I handle everything."

"My job is more supervisory than secretarial," said yet another. "I have three women under me."

Large, audible pause, as if the Beast had indeed made it to Bethlehem and we all awaited its first move. What now? I had innocently called together a group of secretaries and suddenly found myself with a cadre of office managers. Should I graciously call the meeting to a close, apologize and acknowledge my *faux pas*?

"Do you," I asked one, "still type his letters?"

"Well, yes."

"Do you still," I ventured, "schedule his appointments?"

"I do, but only because . . . ."

"What about the telephone? Wasn't it *your* voice that answered when I called?"

"Listen," I said. "Don't you see how strenuously each of us avoids identifying with the word 'secretary'? My boss calls me a 'clinic coordinator,' and that is administrative work. But I am not paid an administrator's salary, not even a junior administrator's salary. Are you paid managerial salaries, you who call yourselves managers? And yet we agreed before that it's not only the money we're exercised about, although a good salary does tend to legitimize in our society. I'm looking for an answer, even a *hint*. What is it about being called secretaries that bothers us so much?"

"I believe," said a woman who'd done this work for 35 years, "there's a stereotype about the secretary. She's considered a dummy who paints her nails and occasionally answers the telephone. Look how television portrays us. Have you seen

Carol Burnett do the 'dumb secretary' routine?" We all groaned.

"I haven't had time to paint my nails on the job in ten years." We all laughed.

I should mention we had one male guest who was secretary to a busy and influential woman doctor. In his case, I considered things might be different. He did not work for a man, nor did he have to identify with the stereotype of the female secretary. Perhaps he was free of the rather vague and under-defined malaise which troubled us. Yet he'd come to our meeting.

What we found out was interesting. First of all, he asserted himself with doctors, administrators and other higher-ups in ways none of us would dare. He had never been taught he could not do these things. When he felt an administrator's gratuitous new ruling regarding secretaries was unfair, he sent a strongly-worded rebuke to that administrator. He received a perfunctory slap on the hand from his boss but was not fired. That administrator threatened, but never carried through his threat. (Male administrators seem at a loss how to deal with male secretaries; perhaps there is the uncomfortable feeling that "there but for the Grace of God go I.") On the other hand, his hourly wage was well below what any of us made, and he did much more overtime and unpaid week-end work than any of us did. I knew I would never work for that wage. It was here, at the interface of work production and salary, that I felt he bought the picture of secretary-as-inferior.

We experienced the excitement of some of the first women's consciousness-raising sessions. But not the naiveté. We knew only too well that excited talk, confession, self-revelation, would not substantially alter our work situations. After the "high" of the meeting, we would return to the repetitive chores, the inadequate salaries, the tastefully-decorated cubicles, the anonymity.

Each of us had had a dream that we'd let slip. We castigated ouselves for lack of courage. After all, witness the women who, sprung from some cage or other, perhaps some collective cage, were out there making things happen. Business executives, lawyers, doctors – pacesetters. Their man-tailored suits, their attaché cases, were a silent rebuke to us. We felt guilt. We had held back, malingering on our own lives. Suddenly our neatly ordered piles of papers, our flower arrangements on the desk, our clean, freshly pressed blouses and skirts, seemed pathetic, trivial. But did we really want those high-powered careers? Were we prepared to sacrifice the quiet backwater for the rapids? And if not, had we any justification for discontent? Yet we earned our livings; were a responsible part of the economy; gave full value for our wages; worked energetically and with integrity; showed respect to employers and co-workers. Then why the guilt?

"You know everyone looks down on secretaries," said one. "We even look down on ourselves. You say you handle a monumental work load; I know you do. But I also know you think the work you do is meaningless. We've each admitted to settling for something we once perceived as easier than taking the Big Risk. Yes, and the low wages and low status are our self-punishment."

"Wait a minute," said the oldest. "Years ago there weren't many opportunities for women who had to work. There's some history here you're ignoring."

"I stand corrected by history. But at this point in time there is something masochistic in our acceptance of all this. Yet I feel we can't beat the stereotype."

The way society views us; the way we view ourselves. This was the core of our first meeting.

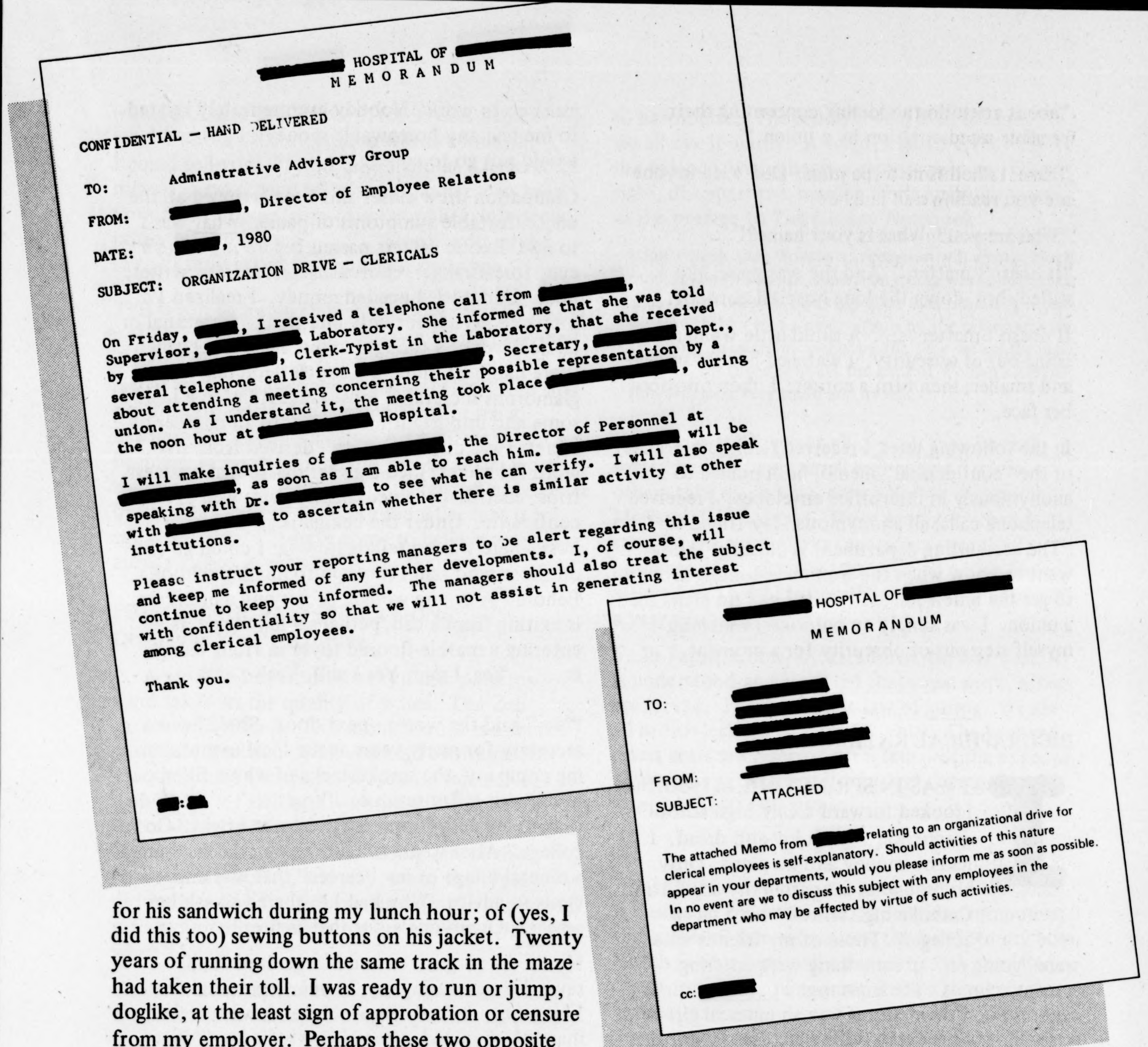
OUR FIRST MEETING was also our last. A few days after the luncheon, my boss called me into his office. "They tell me you're trying to organize a union. Is that so? I told ______ I was sure it wasn't true, but I'd like to hear that from you." My mind burst into several tributaries of paranoia in the few seconds it took to formulate an answer. Was it possible one of the secretaries at our meeting had reported us to Administration? And if so, to what purpose? The meeting was never intended as a union pitch, and we had only mentioned the word "union" in the most peripheral manner. What we were attempting was the exploration of a hitherto unexamined group consciousness. I felt sure none of our group had ratted on us. What then? Probably one of those invited who had not come had told someone. No doubt this person could only conceive of such a meeting in terms of union organizing.

"No, I am not trying to organize a union."

"That's what I thought," he said. "But Administration is worried. Don't you worry, though; I'll handle their paranoia. You don't have to become involved at all. And please," he said smiling, "don't try to undermine the hospital."

My boss was kind and forgiving; big and powerful. He was going to take care of me. He would run interference for me. At that moment I felt small and weak, afraid. One secretaries' consciousness-raising session had not changed me much.

As I said, I have never been an organizer. In many important areas I consider myself too timid, too passive. My personality is no doubt saturated with servility from twenty years of low wages, low status; of preparing the boss's coffee and running



[redacted] HOSPITAL OF [redacted]
MEMORANDUM

CONFIDENTIAL — HAND DELIVERED

TO: Adminstrative Advisory Group

FROM: [redacted], Director of Employee Relations

DATE: [redacted], 1980

SUBJECT: ORGANIZATION DRIVE — CLERICALS

On Friday, [redacted], I received a telephone call from [redacted], Supervisor, [redacted] Laboratory. She informed me that she was told by [redacted], Clerk-Typist in the Laboratory, that she received several telephone calls from [redacted], Secretary, [redacted] Dept., about attending a meeting concerning their possible representation by a union. As I understand it, the meeting took place [redacted], during the noon hour at [redacted] Hospital.

I will make inquiries of [redacted], the Director of Personnel at [redacted], as soon as I am able to reach him. [redacted] will be speaking with Dr. [redacted] to see what he can verify. I will also speak with [redacted] to ascertain whether there is similar activity at other institutions.

Please instruct your reporting managers to be alert regarding this issue and keep me informed of any further developments. I, of course, will continue to keep you informed. The managers should also treat the subject with confidentiality so that we will not assist in generating interest among clerical employees.

Thank you.

[redacted]:[redacted]

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[redacted] HOSPITAL OF [redacted]
MEMORANDUM

TO: [redacted]

FROM:

SUBJECT: ATTACHED

The attached Memo from [redacted] relating to an organizational drive for clerical employees is self-explanatory. Should activities of this nature appear in your departments, would you please inform me as soon as possible. In no event are we to discuss this subject with any employees in the department who may be affected by virtue of such activities.

cc: [redacted]

---

for his sandwich during my lunch hour; of (yes, I did this too) sewing buttons on his jacket. Twenty years of running down the same track in the maze had taken their toll. I was ready to run or jump, doglike, at the least sign of approbation or censure from my employer. Perhaps these two opposite reactions from him were indistinguishable to me. Perhaps any intensity in his tone of voice conveyed to me that something is happening: beware.

In the next few days I received several anonymous phonecalls telling me to watch what I said, my phone was being monitored. One caller said she too "was interested in unionizing" and would I tell her what plans I had in that direction. When I protested I was not a union organizer and could I please know her name, she held back. I got worked up. "You ask me what my 'plans' are, yet you won't even tell me your name! Who are you calling for?" (Visions of myself harassed, humiliated, fired; and during a recession too, with jobs scarce – visions of myself getting older, with less chance of being hired for jobs that would naturally go to younger, prettier women, etc., etc., etc.)

At three o'clock one afternoon a woman called my office and said: "Never mind who this is. Just meet me in front of the cafeteria in ten minutes. I have something for you. I'll be wearing a red blouse." My heart pounded as I walked the long basement hall to the cafeteria. I had read of the New Pinkertons, experts who use sophisticated methods of psychological intimidation to daunt suspected union organizers. Was this one of their tactics? Or perhaps the hospital's methods would not be so *au courant*. I would doubtless be beaten by Administration-hired goons before I ever reached the cafeteria. I peered suspiciously into every open door I passed. Really! What was I doing to myself? I had to laugh.

I walked back and forth in front of the cafeteria several times. Where was this person with the hot item? Strange that I had not noticed a small, elderly woman in a red blouse standing just to the side of the cafeteria door. She was the sort of person who is so self-effacing as to be invisible. She stuffed into my hand the memorandum I'm including with this account (which please disguise, for legal reasons); which was folded in ther hand so that it made 16 little squares; which was marked "Confidential – Hand Deliver" and was sent to the "Administrative Advisory Group" regarding a certain secretary with my name who made telephone calls to other secretaries and clericals "about attending a meeting concerning their possible representation by a union."

"Here, take this into the john. Don't let anyone see you reading it."

"Who are you? What is your name?"

"It doesn't matter." And she was gone, like a stifled shot, down the long hospital corridor.

It doesn't matter . . . . A timid little woman had come out of obscurity. I watched her get smaller and smaller, then turn a corner. I hadn't noticed her face.

In the following week I received two more copies of the "confidential" memo, both mailed to me anonymously in interoffice envelopes. I received telephone calls, all anonymous. My friend said, "The accounting department is buzzing. They want to know when the woman is coming around to get the union started." But I had no plans for a union. I was simply an onlooker, watching myself step out of obscurity for a moment.

## BIOGRAPHICAL RATIONALE

IT WAS IN SPRINGTIME, in 1960, that I looked forward to my high school graduation – with joy and dread. I had no money and no plans. Only about one in four from my small-town Catholic high school "went on to college." Those of my friends who were "going on" to something were entering nursing schools. The nuns urged Catholic nursing schools upon them, but it was an unusual girl who was willing to submit to those strictures for another three years. The real rebellion involved enrolling in a non-Catholic nursing school, with its dubious and possibly profane medical practices. I admired my friends' independent choices. My father said: "Take my advice, go to nursing school." But three years cooped up in a hospital did not fit my pictures.

Should I go to college? Certainly, the curriculum I'd chosen in high school had not prepared me for it; I'd taken "commercial" courses. Also, the few college-bound kids seemed dry and pedantic, bookworms you could never expect to have any fun with. Their heads were always in the future; holidays they spent studying. Would college students be like this? I felt a bursting-with-something feeling; was reading Kerouac's **On the Road**, **Howl** and the other Beat poets; frequented coffeehouses in the city. What I wanted was – To Live. How to go about doing that I did not know. But it didn't include nursing school, even a non-Catholic one. If I couldn't yet figure out how To Live, I could at least go On The Road – after I saved some money, of course. And for this I must go to work. Nobody even remotely related to me had any borrowable money. I guessed I would not go to college.

Graduation drew closer and I experienced all the uncomfortable symptoms of panic. What was I to do? Exotic careers passed before my mind's eye: forest ranger, chorus dancer, actress, writer, poet. Damn it! I needed money. I realized I'd prepared myself for only one thing: secretarial or clerical work. I thought about that. Recently there had been some TV shows depicting rather glamorous secretarial jobs: Gal Friday to a handsome and important man, privy to all manner of secrets (was not "secretary" derived from the word for secret?); co-traveler on foreign business trips; cherished, valued, highly-paid, well dressed confidante. Under the benign aegis of such a boss, there was no telling how far I could go (fie on those who said I must go to nursing school!). Behold! A young woman is carrying a briefcase, is exiting from a cab, perhaps a limousine, is entering a marble-floored foyer in Hong Kong, is . . . . Yes, I said, Yes I will, Yes!

"No," said the woman next door. She'd been a secretary for many years at the local manufacturing company, the smokestacks of which filled our town with gritty residue. "You don't want to do that; there's no future in it. You're bright. Go to college." After weeks of fantasizing, I'd constructed a mental image of my "career" that was impervious to advice. Why had I bothered to ask her advice? Or anyone's, for that matter?

My life has organized and reorganized itself several times during my 20-year secretarial career. I have been in and out of school; have traveled, married, divorced, remarried; studied art, dance, textiles, writing; have lived on both sides of the country, have met and known fascinating people. Much change, but one constant: for 20 long years I have remained a secretary. I have been a legal secretary, a medical secretary, a corporate secretary; have worked for manufacturers, employment agencies, brokerage firms, consulting firms, municipal bond firms, you name it. I have edited innumerable manuscripts of semi-literate bosses; have bought, on my lunch hours, countless gifts for wives and "friends"; have truly been the confidante – soothing, encouraging, listening; have planned itineraries; screened thousands, possibly millions of calls; have in a pinch done research, graphic layout, telephone surveying. You name it. I have managed offices without being paid a manager's salary; have done administrative work without being paid an administrator's salary; have coordinated a busy hospital clinic without being paid a clinic coordinator's salary.

If you were to interview me for a job you might be tempted to brush aside those credentials. "But how fast do you type?" you might ask. I would not feel embarrassed, for in that department I excel. "One hundred words a minute," I could tell you. "I also take steno at 120 words a minute, have a good telephone manner, can keep your books, order your office supplies, interview potential employees . . . ." "Stop!" you might say. "I only asked you how fast you type."

This is not to imply those skills I mentioned would not be used on the job. They would, oh how they would. But the prospective employer is embarrassed by the salary he is about to offer, given that portfolio of skills. He is going to offer me a beginning secretary's salary. After all, am I not a beginner in his organization? My financial worth is not a function of my accumulated job experience but rather a reflection of my job title, that is to say, "secretary." I have come to believe a certain aura, a stigma even, attaches to that word.

## PHILOSOPHICAL SPECULATIONS:
### Or, Maybe It's My Attitude

1. A monk rakes sand into rhythmic patterns. Sand takes on the quality of water. The Zen garden at Ryoan-ji. This monk's work is a sacred trust (is a function of his spiritual evolvement). To one not of the chapel it appears repetitive, menial. After all, he is working with his hands. After all, he is not thinking. And my work. . . . There have been moments, arising out of the chaos of inferiority, self-pity, when the typing did itself, when I got the second wind and plunged into mountains of white paper, energized, inspirited, when I knew . . . .

2. Recession. The crashing economy. Swarms of the proletariat rise up, crying for money, always money. There is no money, they tell us, in the winter of our discontent. Bad timing, they tell us. Inexpedient and perhaps immoral to suck at the nation's lifeblood. This is the season to gird loins, tighten belts, push together, conserve. My boss, who makes $100,000 a year, tells me money is tight, I must be patient. I am not being facetious when I say I know he is right.

3. Alright, you will not cease your demands:

> **The transformation will not be easy, for smart machines bring with them the seeds of widespread economic dislocation and social unrest. Eventually, for example, they will make possible the full automation of many factories, displacing millions of blue-collar workers with a new "steel collar" class. Even office workers will feel the crunch, as smart machines do more and more of the clerical work.**
>
> **–Newsweek, June 30, 1980, "Machines that Think"**

My husband, when out of work recently, said to me: "The only thing harder than working is not working."

4. I do not believe this is the time to sow the dragon's teeth. It is always easier to polarize than to harmonize. The center's hold is so tenuous we all eye it warily. A word, a gesture, may tip the balance, with disastrous consequences. One sighs, disappointed, reading Doris Lessing's words in the preface to **The Golden Notebook**:

> **I don't think that Women's Liberation will change much, though – not because there is anything wrong with their aims but because it is already clear that the whole world is being shaken into a new pattern by the cataclysms we are living through; probably by the time we are through, if we do get through at all, the aims of Women's Liberation will look very small and quaint.**

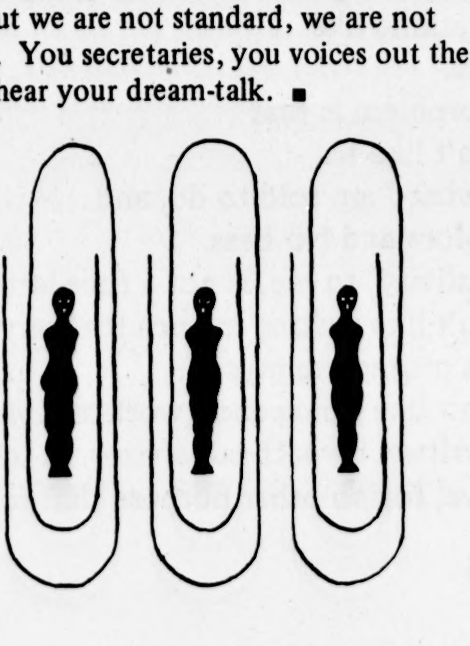
If we do get through at all . . . . It may be that some lives are "very small and quaint," while others take on an epic, even a heroic, dimension. My boss, for example. There are times when I stand in the supermarket agonizing over the purchase of an avocado, the price of which has inflated to $1.49. It is at these times his $100,000 a year seems heroic.

5. In Japan, China, India, all over the Far East, it is understood and accepted that some serve, others are served. The inexorable law of karma. We are all in this leaky boat called society. The best and driest seats are reserved for a few – at the expense of the many. Why am I so bitter? I do not really want his $100,000 a year.

* * * * * * *

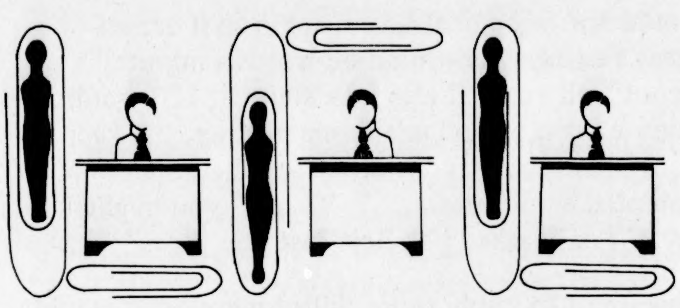
I was intimidated by a memorandum. I am also intimidated by recession, depression, computers, the words of famous writers, the words of my boss. Which is why I am still a secretary 20 years later. Yet it is not bad, not wrong to be a secretary, as I've pointed out.

I read a poem once by Theodore Roethke, in which he characterized an office as a place of "standard gray duplicate faces." It was a sad poem, and, really, it has always seemed sad to me that human beings must be cooped up in "skyscrapers" which have nothing to do with sky, the sky which spills its burnished light all over the pavements in spring, which rains real rain and is so beautiful to look at, whatever its daily aspect. When secretaries get together, they seem to be talking in a dreamworld. But we are not standard, we are not duplicate. You secretaries, you voices out there, I long to hear your dream-talk. ■



B.S. BEAVER

# Your Civil Service isn't either, Uncle Sam



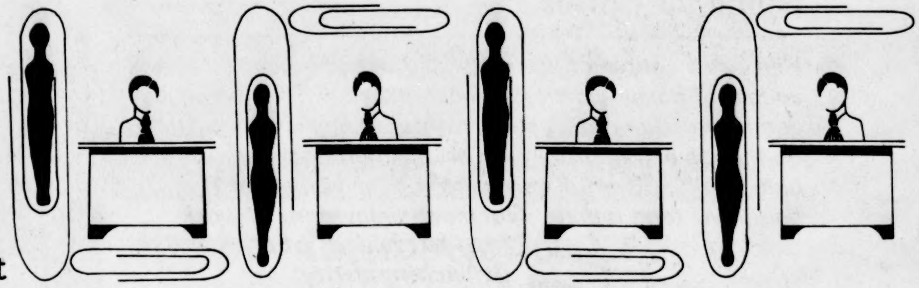
B.S. BEAVER

*by Murray Felsher*

At first it seems so good.
The salary is good. Very good.
The security is good. Very good.
The benefits are good. Very good.
And if you breathe regularly,
More or Less,
and if you
Do what you are told to do,
No More and No Less, then you get
More money and
More security and
More benefits.
My problem was that I was hired as a
G.S.-15.
I didn't have to learn how to say,
"Yes,"
When I knew that the answer was
"No."
I didn't have to parrot inept supervisors to
Guarantee good performance evaluations.
I didn't have to suffer fools,
(And of Them There Many Are.)

That was in 1971, and I made something like
$25K.
I made up my mind to resign early in 1980, a step-6 making
Something like
$50K.
My problem is that
I don't like to
Do what I am told to do, and
No More and No Less.
(Creativity, to me, is not a four-letter word.)
I don't like writing memos that serve no other purpose
Than protecting myself.
I don't like doing good work and watching it being
Re-written by each supervisor, in turn,
Above, for no other purpose that to allow each

*Geologist Felsher did his government time with the Environmental Protection Agency (EPA) and the National Aeronautics and Space Administration (NASA). His speciality is remote sensing – satellite perspective on the working of the Earth's surface.*
*—SB*



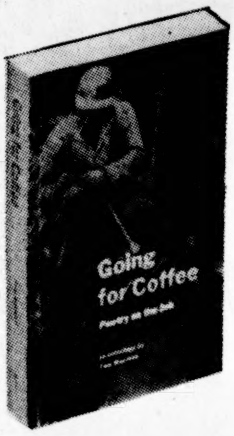
To write,
"Re-written by . . ."
(After my job, is he?
Well, that'll show
The bastard.)
I don't like praising pap.
I don't like not getting credit for what
I myself do right.
And I don't like not getting blamed for what
I myself do (w)rong.
I don't like institutionalized anonymity
That rewards mediocrity and punishes
Individualism.
I don't like to see talented people slowly
D-r-a-ined
Of their inventiveness and enthusiasm,
As they learn to
First Compromise, then
Not Recognize, and,
Finally,
Deny,
Their Principles.
I don't like the basic premise of management in
Government, which unlike the private sector, where
the bottom line is
$ PROFIT $,
Denies the existence of a
?DECISION ?
So I decided to leave.
("Leave a $50K job, with a hefty mortgage, car payments,
the oldest of three kids about to start college, and no
money in the bank . . . ARE YOU CRAZY?)
So I decided to leave.

I don't like being surrounded by
Frightened people.
De-Moralized people.
De-Balled people.
Selfish people.
Unhappy people.
I don't like watching people
Watch each other.
Waiting.
Waiting for a change in management.
Waiting for a change in administration.
Waiting to retire.
Waiting to die.
I don't like smiles that aren't,
And silences that are.
And lies.
I especially don't like lies.
(And of Them There Many Are.) ■

## Going for Coffee

*Here are a couple of hundred hard working poems by a couple of dozen North American poets. Their poems detail something basic and unromantic and awfully true — on-the-job experience. Lots of different occupations— blue, pink, and white collar — are given voice, but the dominant tone is grey. Not much enjoyment of work here, but no lack of pride and unflinching clarity.*

*—Stephanie Mills*



**Going for Coffee**
(Poetry on the Job)
Tom Wayman, Editor
1981; 209 pp.

**$6.95** postpaid from:
Harbour Publishing
P.O. Box 119
Madiera Park, BC
V0N 2H0
Canada

or Whole Earth
Household Store

●

**Love Goes Out of Style** *by David Beaver*

sometimes I pretend I'm stupid
and satisfied with the life
of a cabbie
After all, I tell myself,
where else is there to go
that you haven't been to
at least twice today . . .

●

**The Secretary Meets the Ecology Movement**
*by Bronwen Wallace*

In this office
I am accessory
to machines.
My typewriter does everything
except make coffee
And behind me
are rows of machines
ready
to copy    duplicate
collate    and staple
a blinding quantity of written words
a whole forest of paper.
I am, therefore, not dismayed
when, at 4:15
my boss
brings me a 50-page document
of which he wants
a mere 100 copies;
Without even moving from my chair
I flick the switch on the stencil-maker
(which makes stencils directly from typed copy)
Check the fluid in the ditto machine
And set up the collator . . .
He stops me with a smile.
"No, my dear, I want this *typed* on stencils, please.
You see, it's double-spaced. I want it single-spaced.
To save on paper."
He smiles again, expansive
with the vision
of a dozen trees, unmutilated.
I frown.    Calculate
that even with my
miraculous typing machine
the job will take
a day and a half
(Two, if I count phone calls
letters-that-must-go-today
trips-to-personnel
and coffee breaks)
and will cost
(in wages alone)
$3.50 per hour x 8 x 2
= fifty-six dollars
and will save
5 trees @ $10
2 trees @ $25    what does a tree cost?
1 tree @ $50
½ tree @ $100
The coffee breaks will have to go    I guess
I mean, after all
we all want to
do our bit
for ecology

don't we?

## The Chain Saw Dance

*David Budbill admires his neighbors. Like good lightning rods, his neighbors take this attention and send it right into the ground. (Or, as science tells us now, the lightning first comes out of the ground, then out of the neighbors and into the poet's head? Works either way.) He reveals his praise by allowing them to speak their own peace, anger, and sadness. Budbill listens, describes a few facts, but poses no theory nor romance. These aren't your celebrated heroic personalities. But as we increasingly revolve around our mundane successes — and failures — with an appreciative proud air, we become more acquainted with the dignity of commonness. Shitagoddam goddamnashit, I have loved these poems for so long now (four printings in four years). I realize I cannot parade their attributes anymore than I could show off a farmer down the road from me.*

*—Terry Lawhead*

The Chain Saw Dance
By David Budbill

**The Chain Saw Dance**
David Budbill
1976, 1977; 64 pp.

**$3.59** postpaid from:
David Budbill
Wolcott, VT 05680

●

. . .
But one night while they were still at the homeplace,
Hermie got pissed at something, nobody knows what,
and flew into a rage, which he did about twice a week,
but this time went too far and lit both house and barn
and watched them burn.
When the neighbors came Hermie was out in the snow,
in the dooryard stomping and screaming,
"Burn! Goddamnit!
Burn! you wuthless place.
You never was no goddamn good!"

Nobody could ever be quite sure when Hermie was drunk.
He acted crazy all the time.
There's nothing left of the Newcome place now,
only the springbox. Those tamarack boards
will last forever.

Then they moved over to the shack by the cemetery.
Hermie liked it there,
said it was the first place he ever lived
where he had decent neighbors.

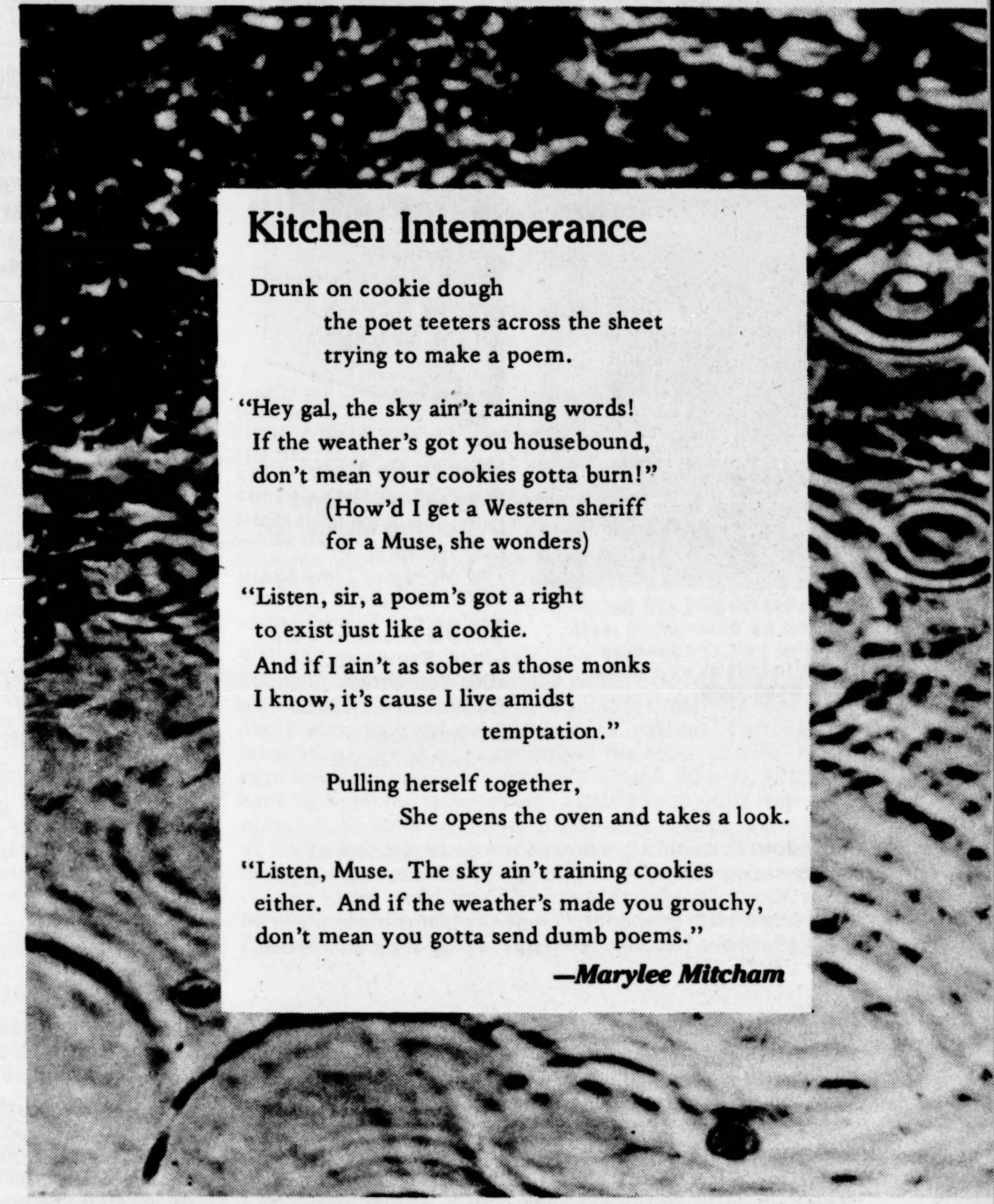
Antoine tells about going past there on a Saturday night
and seeing
Hermie and Florence dancing with the chain saw going
in the middle of the floor.
Hermie and Florence'd get drunk,
then Hermie would adjust the carburetor on the saw
so it would run too rich
so it would sputter and bounce with a rhythm
worthy of a good musician.
Then they'd sing and dance
to the music of the saw. . . .

# Three Love Stories

## love story

i figure we'll be together
forever
why not?
he's so much a part of me
yet strange enough
that i can't take him for granted
forever is until we can't be together
maybe one of us dies
maybe one will murder the other
maybe one will just disappear
we figure if one of us gets
mentally & physically fucked up
dribblin spit
sittin in our own piss
can't even pick our nose
& lose our mind
we'll perform a mercy killing
i told him if i
roll my eyeballs twice
then look cross-eyed
it meant i was miserable and
to off me
that's presupposin i'll even have
that much control
otherwise he can assume i'm relatively
happy
observin things around me
reflectin on past events
he can leave me in a corner
watchin a flickerin candle until
i roll my eyeballs twice
& then look cross-eyed

**—Nila Northsun**



## Kitchen Intemperance

Drunk on cookie dough
the poet teeters across the sheet
trying to make a poem.

"Hey gal, the sky ain't raining words!
If the weather's got you housebound,
don't mean your cookies gotta burn!"
(How'd I get a Western sheriff
for a Muse, she wonders)

"Listen, sir, a poem's got a right
to exist just like a cookie.
And if I ain't as sober as those monks
I know, it's cause I live amidst
temptation."

Pulling herself together,
She opens the oven and takes a look.

"Listen, Muse. The sky ain't raining cookies
either. And if the weather's made you grouchy,
don't mean you gotta send dumb poems."

**—Marylee Mitcham**

## men without women

men without women so often go to seed. i've known so many of them sleeping in their clothes, unshaven, the fridge full of beer and one onion rotting in a plastic bag. if you live close to them you hear their midnight yell over the loud music, notice the way they patronize your girlfriend whenever she comes over, the devotion with which they pursue their holy hobbies, the way they're always getting laid off.

sometimes they leave for europe or they buy a house, but it becomes such a disorder that they are always losing things in it — borrowed novels, underwear, rare blues albums — until these things surface again and can be retrieved. sometimes they become buried alive under their habits and wouldn't leave a burning house unless such an evacuation was a part of their regular routine (but, of course, they're not alone in this).

they talk to people on buses a lot but, if it's a woman they're chatting with, they come across as desperate and eccentric and unable to be cultivated properly without the expense of a great deal of effort which these women can never muster unless they are very desperate themselves. this can go on for five or even ten years, but, if it continues much beyond that, they are not likely to be helped out of their hole by any woman however well-intentioned.

by then, they have a thousand comfortable habits in place of a wife, they win enough at the races to almost offset their losses, and they know the lonely walk home from the beer parlour and the winter sky as intimately as any woman's thighs.

by then, they can never be divorced from themselves again.

**—Don Austin**

---

*"Love Story" is by Nila Northsun, a Nevada Indian who publishes through Duck Down Press, Union, Washington. Marylee Mitcham lives in Kentucky, wrote a story called "Background Music" we printed in the Winter '79/'80* CQ. *Dan Austin is unknown to us. Ken Kesey sent Austin's piece to be shown to the Governor of California, who Kesey thinks should be married. It was originally printed by Pulp Press, Vancouver, Canada.* *—SB*

## How to Be Your Dog's Best Friend

*This is an exceptional book not only on training, but also on canine behavior. I was surprised to discover the breadth and depth of understanding and knowledge shown by the authors. This is not a religious book, except in the devotedness shared by the monks with their dogs. With this system the dogs are with their handlers nearly 24 hours a day, even during the monks' lengthy periods of silence, with which the dogs must cooperate. One of the most amazing photographs in the book (to me) was of the monks at a meal, with all their dogs lying down silently, in the dining room, with no friction among the dogs.*

*This book covers basic obedience training, but more importantly it attempts to teach you how to develop a real closeness with your dog. It does not shrink from the unpleasant aspects of training either — correcting deep-seated problems. The Brothers are famous for de-tuning or de-training attack dogs "gone bad," which is no simple task.*

*—Jill Bryson*
*Aeroglen Irish Wolfhounds*

The Monks of New Skete
HOW TO BE YOUR DOG'S BEST FRIEND

**How to Be Your Dog's Best Friend**
(A Training Manual for Dog Owners)
The Monks of New Skete
1978; 202 pp.
**$8.95** postpaid from:
Little, Brown and Co.
200 West Street
Waltham, MA 02154
or Whole Earth Household Store

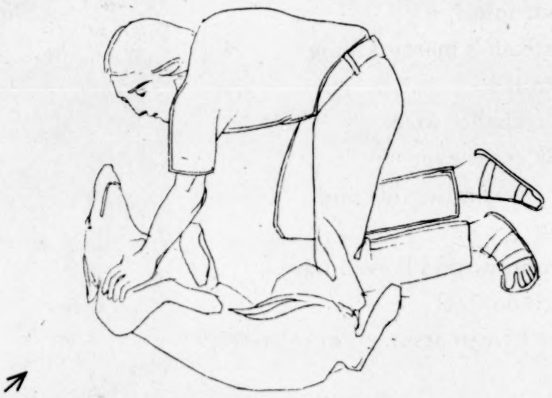
**Chronic forgers can be halted by passing the leash behind you and leaning back into it as you come to a dead stop.**

●

Boredom and ennui are one of the worst aspects of modern dog life. Chewing, digging, nuisance barking, poor appetites, and stool eating are often in some way connected with boredom. These problems often occur in dogs that have become "kennelized" by such uncreative play yard areas.

●

We are dangerously out of touch with our natural roots. For many people, the only touchstones with the natural world still readily available are dogs and houseplants.



THE ALPHA-WOLF ROLL-OVER

This disciplinary technique is nicknamed for the type of punishment the lead wolf dishes out to misbehaving members of the pack. . . .

Grasping the scruff of the dog's neck firmly, roll the dog over onto its back. When you roll the dog over, make your movement quick, firm, to the point. Don't casually guide the dog over as if you were going to groom it or play with it. Shove the dog onto its back with vigor. At this point, most dogs will go into the classic submissive posture of all canids. The dog will bend its front paws to its chest, spread its legs wide open, push back its ears, possibly tuck its tail between its legs, and look up fearfully. This is the moment to make eye contact, and continue scolding the dog. Keep the dog pinned on its back by applying steady pressure with your hand on its neck area. Your verbal discipline may now be quieter, but no less firm and direct than it was during the first phase of discipline. You are acting as the Alpha-wolf.

## Dog's life

Taurus Tom is a skinny blond barefoot hippie I knew in San Francisco in the late 1960s. He had a large black dog heavy in the neck and shoulders with pointed ears that curved upwards like horns, called Taurus. Taurus walked with a limp. When I asked Tom why, he replied, "He was run over by the Krishna Juggernaut while I was watching their annual parade. He would have been killed," he added as an afterthought, "but the head swami made them stop and pull Taurus from beneath the wheels. The swami claimed he knew Taurus and that he had been a great swami in a past life."

I left town shortly thereafter and did not return for several years. Upon my return I inquired into the present whereabouts of past associates. I was told, "Taurus Tom went to Hawaii to join a Christian commune there. He is not called Taurus Tom anymore. Taurus died last year, just before Tom left. He was run over by the Juggernaut at the annual Krishna parade."

I thought it curious that a large healthy street-wise dog like Taurus, who had great presence, should be run over twice by a float in a parade. I had only a vague idea of what a Juggernaut is so I looked it up in the dictionary.

"Idol of the Hindu God Krishna pulled around in a large car. Devotees of the God are said to have thrown themselves under the wheels to be crushed to death."

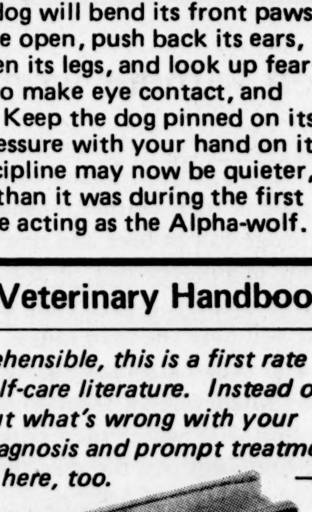
**—Thorndike Barnhart Comprehensive Desk Dictionary**
**(Published by Doubleday, 1952)**

Joe Corgo
Domesa, New Mexico

## Dog Owner's Home Veterinary Handbook

*Comprehensive and comprehensible, this is a first rate extension of the medical self-care literature. Instead of anguished uncertainty about what's wrong with your friend you get confident diagnosis and prompt treatment. Lotta tricks of the trade in here, too.* *—SB*

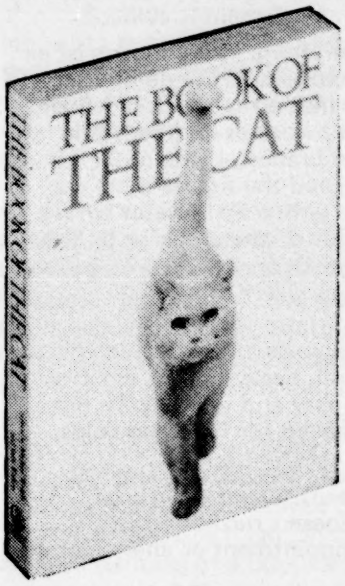
**Dog Owner's Home Veterinary Handbook**
Delbert G. Carlson
and James M. Giffin
1980; 364 pp.
**$15.95** postpaid from:
Howell Book House
230 Park Avenue
New York, NY 10017
or Whole Earth Household Store


Dog Owner's HOME VETERINARY Handbook
by DELBERT G. CARLSON, D.V.M. and JAMES M. GIFFIN M.D.

## The Book of the Cat

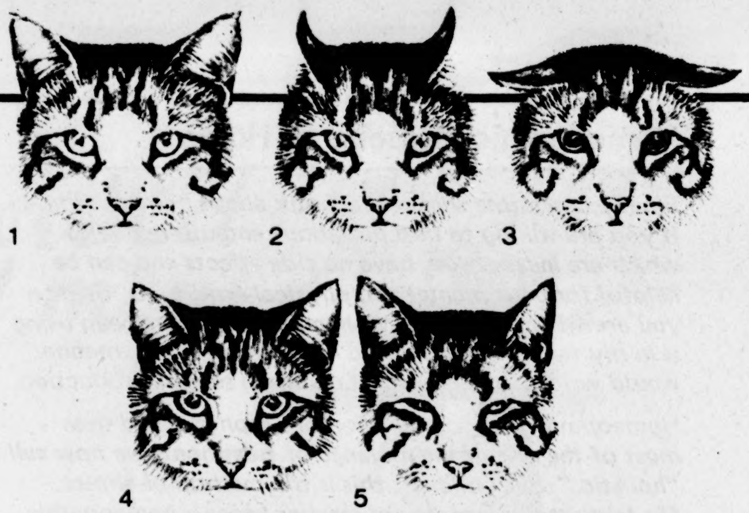
*Whether you own four blue ribbon Abyssinians or a freebie street orphan (as I do), this book answers every possible question about cats. It is graphically a joy to look at, with abundant images of kitties in all their charismatic postures. The chapter on breeds is particularly impressive; sophisticated charts clearly indicate how, for example, Siamese genotypes are combined to produce twenty different varieties of point colors. There are superb illustrations and diagrams describing feline anatomy, behavior patterns (including hunting, dreaming, mating, grooming), and health (diet, geriatrics, first aid). Instead of immediately urging you to "see your vet" should your puss have a problem, this book thoroughly examines common and uncommon disorders, outlines care and remedy procedures, and offers a section on choosing and using a vet. No pet store or cat lover should be without this excellent book.*

*—Rosanne Kramer*



**The Book of the Cat**
Michael Wright and Sally Walters, Editors
1980; 256 pp.

**$9.95** postpaid from:
Summit Books
Attn: Order Dept.
1230 Avenue of the Americas
New York, NY 10020
or Whole Earth Household Store



**Making faces is a fundamental mode of feline communication. A happy cat (1) has perky ears, pupils normal for the prevailing light level and relaxed whiskers. An angry cat (2) keeps its ears erect but furled back; its pupils constrict to slits and its whiskers 'bristle' forwards. A frightened cat (3) is 'wide-eyed' and lays its ears and whiskers flat. A cat playing or hunting (4) wears a face between those of anger and fear; the pupils are open but the ears are pricked and, like the whiskers, thrust forward. The pleasure of being petted shows in the half-closed eyes of the face of ecstasy (5).**

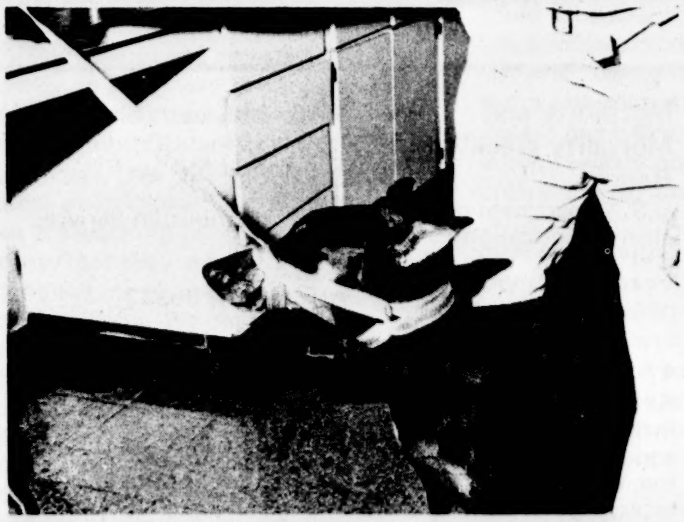
●

Swinging a drowned cat drains water from its lungs and is such a safe and good way to stimulate breathing that many vets advise its use as a routine method of artificial respiration. Hold the hind legs of the cat — one leg in each hand — above and around the hock (ankle), with the cat's belly facing towards you. Stand with your legs apart. Swing the cat forward and then, with a slight jerk at the end of the upward swing, bring the cat down and between your straddled legs. Swing it back to the front of you again, ending each swing with the cat horizontal. Repeat about six times before trying other methods. It is surprising how much space is needed to 'swing a cat'!

## The Healthy Cat and Dog Cookbook

*We own four dogs, friends as well as dog-team. Other than our dog sledding books (the U.S. infantry put out a great one called* **Dog Team Transportation**, *Basic Field Manual, 1941, $3.75 postpaid from Shorey Publications, 110 Union Street, Seattle, WA 98101) our most useful title has been* **The Healthy Cat and Dog Cookbook**. *When you have pets in quantity, food becomes a problem, and healthy, nutritious, non-chemical food even more so. This book provides both guidance and recipes. When I lived in Labrador this summer, I found that many of the older people who had kept dogs for sled work had fed their dogs on much the same recipes as the book contains. The recipes emphasize whole grains and vegetables, explain the vitamin and nutritional needs of pets, and speak to many health problems. It's worth the price if only for its use of brewer's yeast to solve flea problems. (It works with humans and black flies too!)*

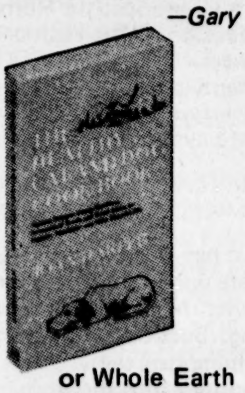
*—Gary Lawless*



**The leash muzzle is useful when you don't have an assistant. Tie the end to a door knob.**

**The Healthy Cat and Dog Cookbook**
(Natural Recipes Using Nutritious, Economical Foods and Good Advice for Happier, Healthier and More Beautiful Pets)
Joan Harper
1975, 1979; 148 pp.

**$3.50** postpaid from:
E.P. Dutton and Co.
Two Park Avenue
New York, NY 10016



or Whole Earth Household Store

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If your pet receives a shot of antibiotics, give him some yogurt to restore the friendly bacteria in his digestive tract. Antibiotics kill all bacteria — friendly as well as unfriendly.

Yogurt is also helpful if your dog or cat has gas and overwhelms you with odors. Again the need is to increase the friendly bacteria that digest food speedily before it putrefies. Putrification can be an indication of too much meat in the diet.

●

Here is a formula for motherless kittens or you can buy a product which is similar to cat mother's milk called Esbilac.

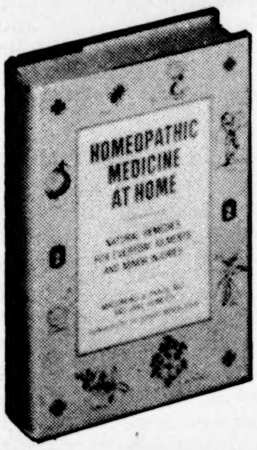
2 cups whole milk or 1 cup evaporated milk and 1 cup water
2 egg yolks
1/4 cup brewers yeast
3/4 teaspoon bonemeal

## Homeopathic Medicine at Home

*Finally, a sensible substantial book about homeopathy. If you are willing to find out about and use remedies which are inexpensive, have no side effects and can be helpful for both mental and physical symptoms, then you are willing to look into homeopathy. I've been using it in my family for years and have hoped that someone would write just this kind of common sense introduction.*

*Homeopathy precedes and is more sophisticated than most of the rest of the melange of treatments we now call "holistic." For children, this is the method of choice. My favorite nursery school teacher keeps a homeopathic kit (described here) at school for stings, wounds, tears, cramps, and bruises.*

*With this book you can understand the principles, order your own remedies, and test the results. (More on homeopathy, see pp. 66-79).* —*Jim Fadiman*



**Homeopathic**
**Medicine at Home**
(Natural Remedies for
Everyday Ailments and
Minor Injuries)
Maesimund B. Panos, M.D.
and Jane Heimlich
1980; 268 pp.

**$10.95** postpaid from:
J.P Tarcher, Inc.
9110 Sunset Blvd.
Suite 212
Los Angeles, CA 90069

●

The twenty-eight remedies in the kit are in tablet form; each vial, clearly labeled, contains 125 tablets. Vials are stored in a 3½ x 6-inch plastic box with a snap lock. Accompanying the kit are six pamphlets, **Family Self-Help Using Homeopathy** (the Washington study course), and a booklet that briefly describes the use of homeopathic medicine.

To obtain a Homeopathic Home Remedy Kit, write to the National Center for Homoeopathy. Cost: around $30; allow six weeks for delivery. The kit itself is prepared by Luyties Pharmaceutical Company in St. Louis, manufacturing pharmacists since 1853; replacements of medicines in the kit are available upon request directly from them.

●

**Drowning**

Recently, it has been shown that the Heimlich Maneuver can evacuate water from the lungs. Therefore, to revive a drowning victim, first perform the Heimlich Maneuver as for choking. Second, clear the airway as quickly as possible by wiping out the victim's mouth and lowering the head or turning onto the abdomen. Then follow immediately with mouth-to-mouth artificial respiration. If the heart has stopped beating, give complete cardiopulmonary resuscitation, which includes external compression of the chest to massage the heart.

Persist in your efforts until help arrives. Unlike the choking victim, who will die in four minutes unless aided, drowning victims who have been submerged for as long as half an hour have survived.

As soon as possible, give *Antimonium tartaricum*, made from tartrate of antimony. *Antimonium tart.*, one of our valuable remedies from the mineral world, is indicated when the patient is cold and blue, is covered with clammy sweat, has rattling respiration, and is drowning in the body's own secretions, whether from actual drowning or from respiratory or cardiac failure. Dosage: Every ten to fifteen minutes, or until improvement is evident.

Since it is dangerous to put anything in the mouth of an unconscious person, soften two tablets in one-quarter teaspoon of water, and place inside the cheek or under the tongue. The medicine will work as long as it is in contact with the mucous membranes. If the patient is breathing through the mouth and the tissues there are very dry, moisten your finger with a little water before placing the tablets on the inside of the cheek or on the the tongue.

●

*Gelsemium sempervirens* (yellow jasmine). A remedy to consider if the person feels dull, heavy-lidded, complains of aching and chills, is not thirsty and wants to be left alone. *Gelsemium* is often needed for flu, head colds, tension headache.

*Ignatia amara* (St. Ignatius bean). *Ignatia* is a grief remedy for the person who doesn't recover from an emotional upset such as disappointment or anger; patient sighs very frequently.

*Ipecacuanha* (ipecac root). *Ipecac* relieves constant nausea with or without vomiting. It also helps to stop a bad nosebleed or bleeding from any part of the body.

*Ledum palustre* (marsh tea). This is the key remedy for puncture wounds, stings, and bites. *Ledum* is also helpful in eye injuries and in sprained ankle.

●

Many people all over the world have avoided flu by taking the homeopathic "cold and flu" tablet. Dosage: one tablet every two to four weeks throughout the flu season. This tablet is made from the combined strains of influenza virus from the major flu epidemics since 1918. The combined strains are then homeopathically prepared and potentized. No ill effects have ever been reported from the "cold and flu" tablet, and the rate of protection has been high. In the flu epidemic of 1918 to 1920, the homeopaths lost only 1 percent of their patients, as opposed to 30 to 40 percent under allopathic care. Fortunately, allopathic treatment today is more effective than in the twenties.

## Morbidity and Mortality Weekly Report

*The* **Morbidity and Mortality Weekly Report** *is published by HEW (U.S. Department of Health, Education and Welfare) for public health officials, doctors, and anyone who is interested. This weekly publication examines epidemics, environmental health hazards and just about anything related to public health. A recent issue offers a statistical breakdown of women having abortions over a five-year period as well as a snappy little horror story on a new strain of hepatitis. The writing is terse, the magazine is no frills and, best of all, this publication is free to anyone who cares to write for it.* —*Kit Cameron*

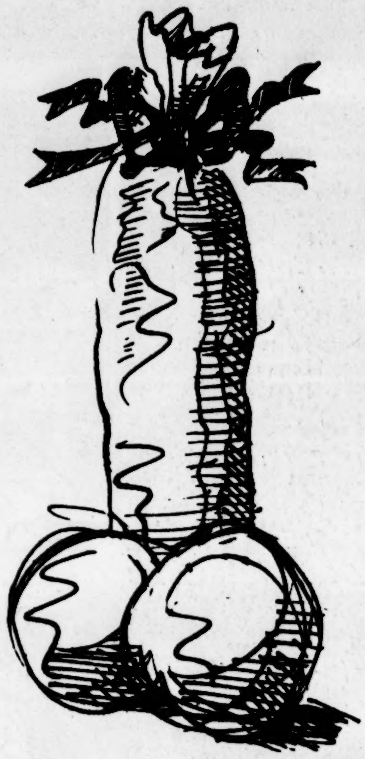
**Morbidity and**
**Mortality Weekly**
**Report**
U.S. Department of
Health, Education
and Welfare

**free** (52 issues/year)
from:
The Center for
Disease Control
Attn: Distribution Serivces
GSO
1-SB-36
Atlanta, GA 30333

●

As in previous years, women who obtained abortions in 1977 were most often young, white, unmarried, and of low parity. 65% were less than 25 years of age, 66% were white, and 34% were of black-and-other races. 76% of all women obtaining abortions were unmarried at the time of the procedure, and 53% had no living children.

# Of Circumcised mice and men


ANDRZEJ DUDZINSKI

Dear CQ:

I read your feel good material with regard to the practice of circumcision with great interest. There is an area in which your research has been lacking, and I therefore hope you will publish this letter for the benefit of your readers. That area is the area of chemical signals and their role in spacing mechanisms.

As you noted, the prepuce is a piece of flesh which is packed with glands secreting a highly odorous complex of heavy chemicals. These pheromones are particularly odorous when mixed with a few drops of urine. Considering this curious human practice of circumcision of males prior to that age of puberty, when the smegma becomes specially odorous under the influence of male sex hormones, one might think that surgical removal of a ductless gland in infancy would be a rather radical procedure, having attendant risks and having attendant psychic trauma both for the patient and for his parents, and that this sort of procedure would cry out for some sort of rather radical hypothesis.

I will summarize the state of the research as it is presently known to me.

If you spray a male mouse with the deodorant trademarked "Man Power," his chances of being assaulted (even by a mouse specially trained for aggression) will be drastically reduced. That's because inter-male aggression in mice is under the control of endocrine-dependent pheromones of the urine and endocrine-dependent pheromones manufactured in the foreskin gland and secreted with the urine. In some way this mixture of signals sometimes invites, and sometimes inhibits, inter-male aggressive behaviors. We have not yet identified these pheromones, so in this respect we are working blind, but we do know that they are endocrine-dependent but are not breakdown products of endocrine. We believe the implicated endocrine hormone is testosterone, because the chemicals occur only in mature males and because dominant males produce more of them than subdominant males. The modified sebaceous glands which appear on the female mouse as vestigial clitoral glands and on the male as preputal glands of the penile foreskin are heavier in dominant than in subdominant males. Removal of this gland makes male mice all the more aggressive, and it is speculated that in the absence of their own odor they are able to detect the smell of other males much more readily. Since other males are less stimulated to attack circumcised male mice, but they are more stimulated to attack uncircumcised males, circumcised males are more likely to be the aggressor and more likely to become dominant. This is curiously similar to the manner in which castratos are likely to become subdominant.

There is also an androgen-sensitive gland under the chins of mice which is involved in some way, and we can see them sniffing at the chin glands of other mice, but we don't know what this does for them. Group members take on a distinctive, familiar odor which suppresses or does not elicit aggression by members of other groups, and thus it is clear that it is the novelty of the smell which invites attack and the familiarity of the smell which inhibits attack.

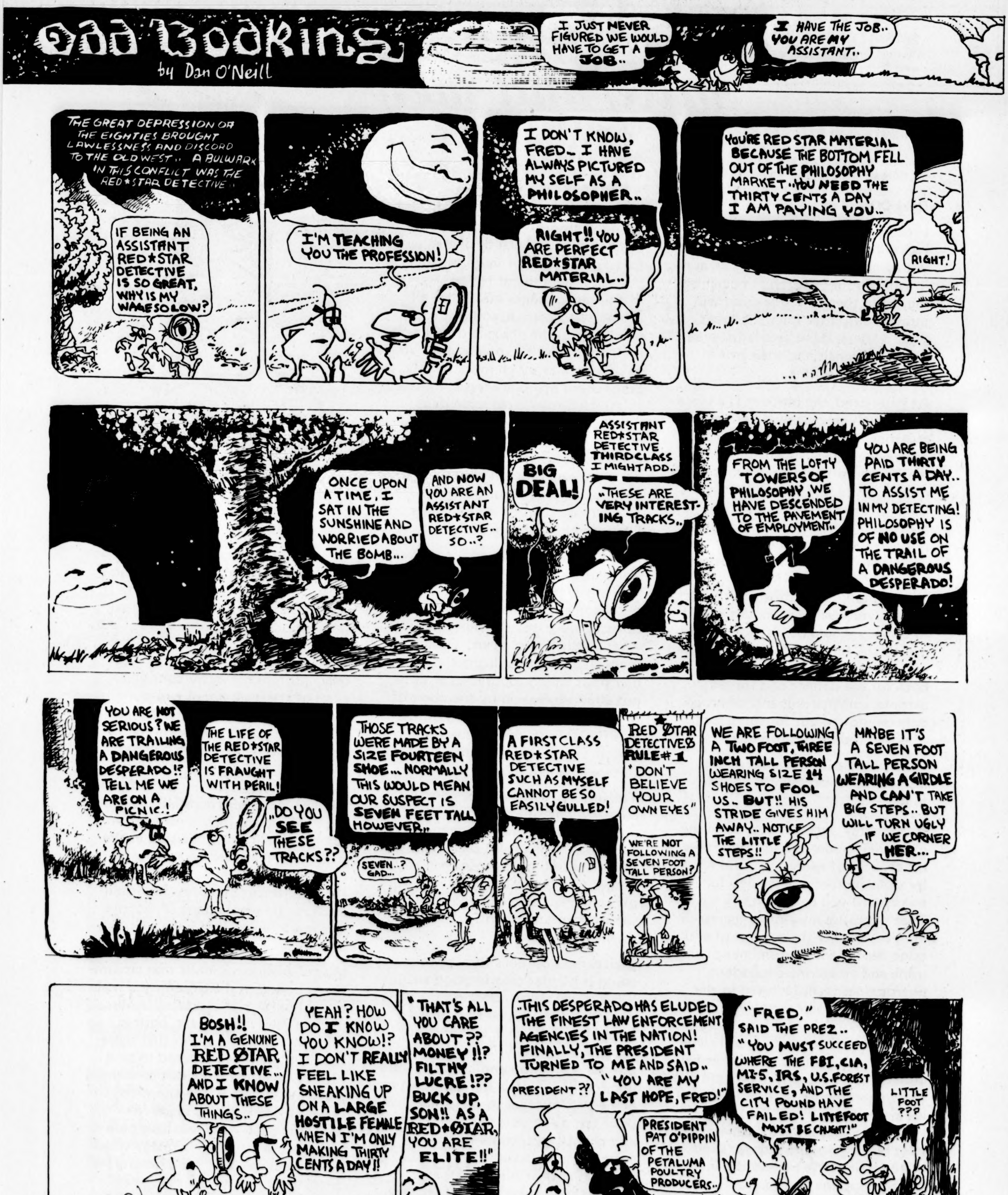
The urine of female mice contains a converse pheromone which signals males to inhibit their aggressiveness and this chemical also seems to be manufactured in androgen-sensitive tissues (the ovaries?). This inhibiting pheromone is also controlled by some ovarian hormone other than estrogen.

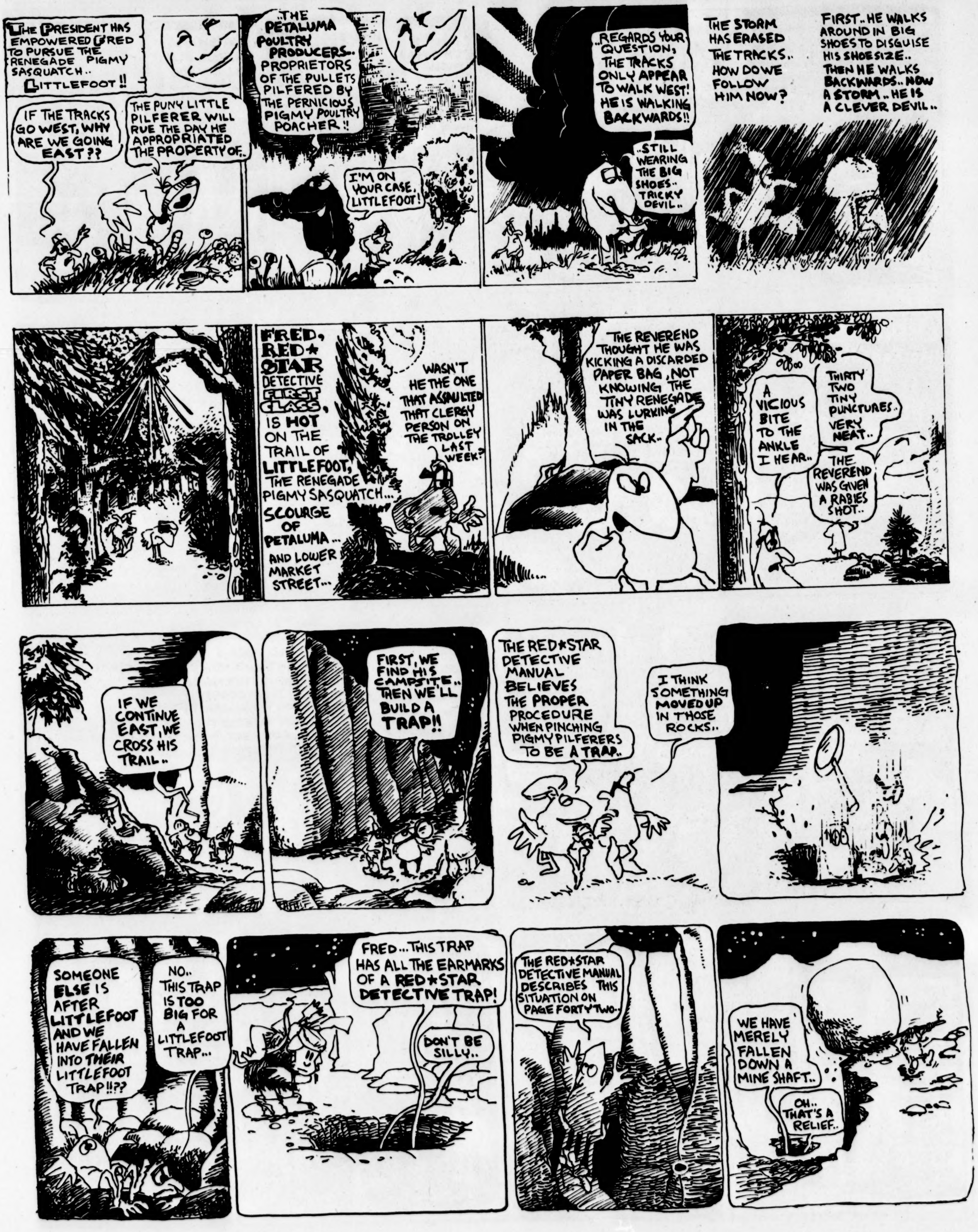
If circumcision does this for mice, could it be that circumcision also fills a social status function for male humans? Could it be that, other things being equal, a circumcised male is more likely to be able to initiate aggression and dominate an uncircumcised male human, through being able to react to the other man's odor but not giving the other man any chance to activate his limbic system and build up to an intense reaction against his own strange odor? Could it be this that enabled some humans in the Levant to break through their tribal group barriers and form supratribal organizations?

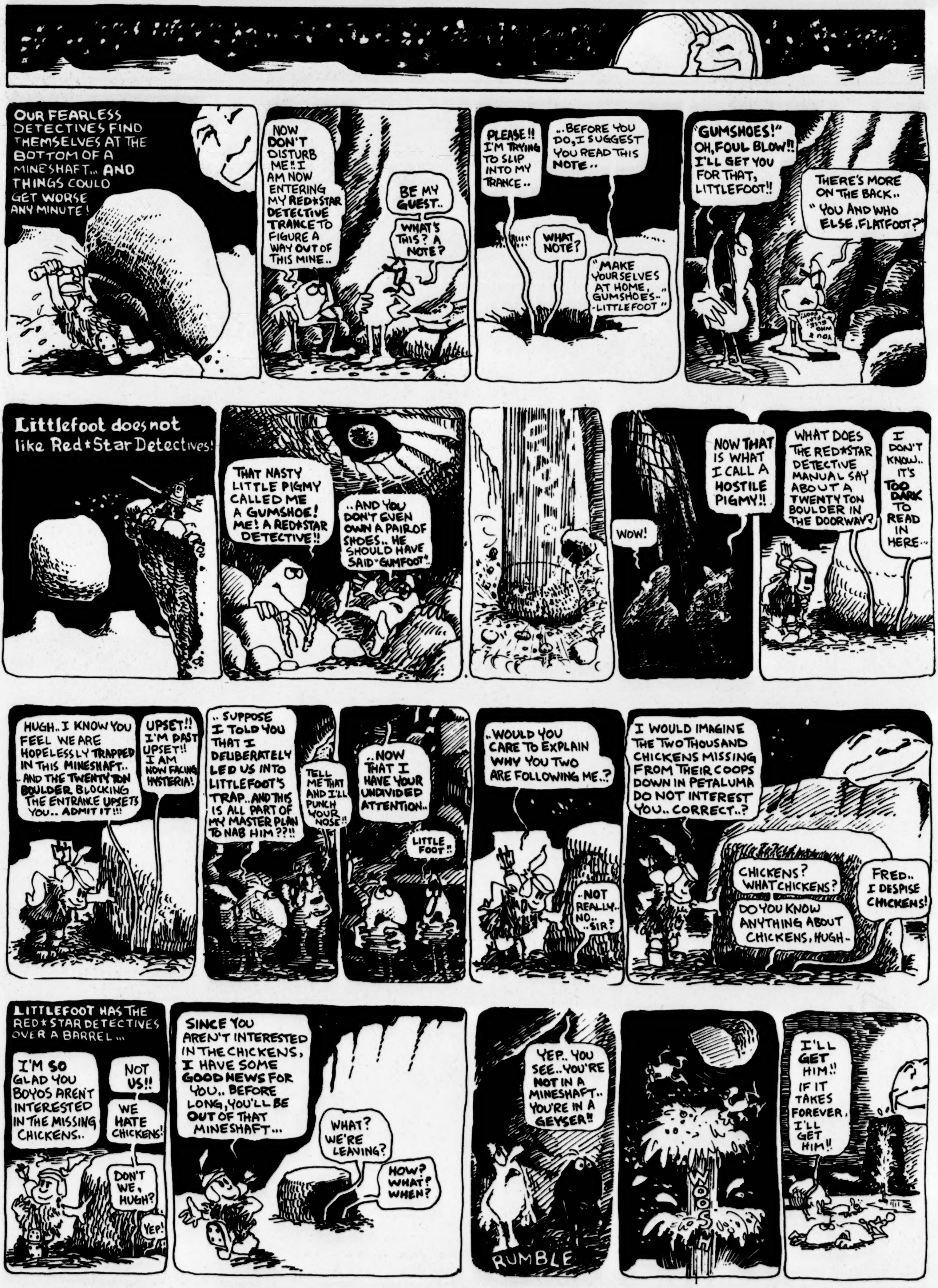
I think it should be clear, from the research I have summarized and plagarized and commented upon above, that the subject of circumcision is much more complex than your reviewers have yet realized. It does have implications for human population control, or rather for our current lack of human population control. Since your quarterly has been a forum for many considerations of the problem of excess human population, and for reviews of the impact of humans on the ecosystems of this planet full of five or ten million different forms of living things, I am certain you will want to take these population spacing implications into consideration prior to making any decision in the matter. It may well be an error to base such decisions on Freudian theories of parental envy and retaliation, or on perceptions of whether it is more fun to fuck with a circumcised male or an uncircumcised male.

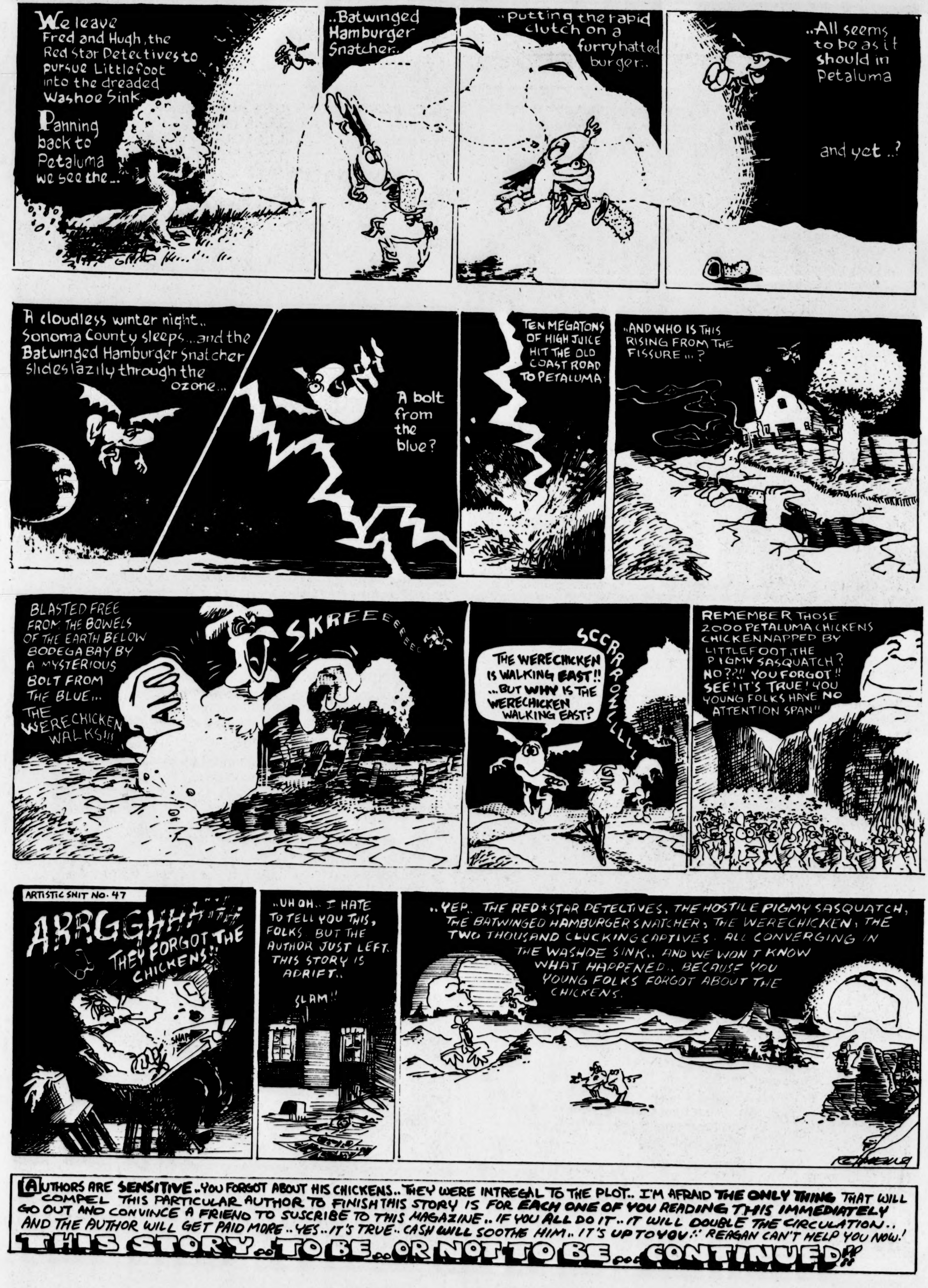
My personal suspicion is that circumcision does give the circumcised male a slight advantage in adult life, in male-to-male encounters, both in mice and in humans, and that therefore it might be considered to be a bit like cheating. I am not concerned with the fairness of the situation, however, but with the apparent conclusion that what we have here is an individual adaptive strategy which (by increasing population density) is disadvantageous to our species as a whole and disadvantageous to our planet as a whole. Yet prohibiting circumcision is not going to save our ecosystems from necrotic collapse.

Shibui Garden
Auberry, California


Odd Bodkins
by Dan O'Neill
I JUST NEVER FIGURED WE WOULD HAVE TO GET A JOB..
I HAVE THE JOB.. YOU ARE MY ASSISTANT..
THE GREAT DEPRESSION OF THE EIGHTIES BROUGHT LAWLESSNESS AND DISCORD TO THE OLD WEST.. A BULWARK IN THIS CONFLICT WAS THE RED★STAR DETECTIVE..
IF BEING AN ASSISTANT RED★STAR DETECTIVE IS SO GREAT, WHY IS MY WAGE SO LOW?
I'M TEACHING YOU THE PROFESSION!
I DON'T KNOW, FRED.. I HAVE ALWAYS PICTURED MY SELF AS A PHILOSOPHER..
RIGHT!! YOU ARE PERFECT RED★STAR MATERIAL..
YOU'RE RED STAR MATERIAL BECAUSE THE BOTTOM FELL OUT OF THE PHILOSOPHY MARKET.. YOU NEED THE THIRTY CENTS A DAY I AM PAYING YOU..
RIGHT!
ONCE UPON A TIME, I SAT IN THE SUNSHINE AND WORRIED ABOUT THE BOMB...
AND NOW YOU ARE AN ASSISTANT RED★STAR DETECTIVE.. SO..?
ASSISTANT RED★STAR DETECTIVE THIRD CLASS I MIGHT ADD..
BIG DEAL!
..THESE ARE VERY INTERESTING TRACKS..
FROM THE LOFTY TOWERS OF PHILOSOPHY, WE HAVE DESCENDED TO THE PAVEMENT OF EMPLOYMENT..
YOU ARE BEING PAID THIRTY CENTS A DAY.. TO ASSIST ME IN MY DETECTING! PHILOSOPHY IS OF NO USE ON THE TRAIL OF A DANGEROUS DESPERADO!
YOU ARE NOT SERIOUS? WE ARE TRAILING A DANGEROUS DESPERADO!? TELL ME WE ARE ON A PICNIC..!
THE LIFE OF THE RED★STAR DETECTIVE IS FRAUGHT WITH PERIL!
..DO YOU SEE THESE TRACKS??
THOSE TRACKS WERE MADE BY A SIZE FOURTEEN SHOE... NORMALLY THIS WOULD MEAN OUR SUSPECT IS SEVEN FEET TALL HOWEVER..
SEVEN..? GAD..
A FIRST CLASS RED★STAR DETECTIVE SUCH AS MYSELF CANNOT BE SO EASILY GULLED!
RED ØTAR DETECTIVES RULE #1 "DON'T BELIEVE YOUR OWN EYES"
WE'RE NOT FOLLOWING A SEVEN FOOT TALL PERSON?
WE ARE FOLLOWING A TWO FOOT, THREE INCH TALL PERSON WEARING SIZE 14 SHOES TO FOOL US.. BUT!! HIS STRIDE GIVES HIM AWAY.. NOTICE THE LITTLE STEPS!!
MAYBE IT'S A SEVEN FOOT TALL PERSON WEARING A GIRDLE AND CAN'T TAKE BIG STEPS.. BUT WILL TURN UGLY IF WE CORNER HER...
BOSH!! I'M A GENUINE RED ØTAR DETECTIVE... AND I KNOW ABOUT THESE THINGS..
YEAH? HOW DO I KNOW YOU KNOW!? I DON'T REALLY FEEL LIKE SNEAKING UP ON A LARGE HOSTILE FEMALE WHEN I'M ONLY MAKING THIRTY CENTS A DAY!!
"THAT'S ALL YOU CARE ABOUT?? MONEY!!? FILTHY LUCRE!?? BUCK UP, SON!! AS A RED★ØTAR, YOU ARE ELITE!!"
..THIS DESPERADO HAS ELUDED THE FINEST LAW ENFORCEMENT AGENCIES IN THE NATION! FINALLY, THE PRESIDENT TURNED TO ME AND SAID.. "YOU ARE MY LAST HOPE, FRED!"
PRESIDENT??
PRESIDENT PAT O'PIPPIN OF THE PETALUMA POULTRY PRODUCERS..
"FRED," SAID THE PREZ.. "YOU MUST SUCCEED WHERE THE FBI, CIA, MI-5, IRS, U.S. FOREST SERVICE, AND THE CITY POUND HAVE FAILED! LITTEFOOT MUST BE CAUGHT!"
LITTLE FOOT ???


THE PRESIDENT HAS EMPOWERED FRED TO PURSUE THE RENEGADE PIGMY SASQUATCH.. LITTLEFOOT!!
IF THE TRACKS GO WEST, WHY ARE WE GOING EAST??
THE PUNY LITTLE PILFERER WILL RUE THE DAY HE APPROPRIATED THE PROPERTY OF..
..THE PETALUMA POULTRY PRODUCERS.. PROPRIETORS OF THE PULLETS PILFERED BY THE PERNICIOUS PIGMY POULTRY POACHER!!
I'M ON YOUR CASE, LITTLEFOOT!
..REGARDS YOUR QUESTION, THE TRACKS ONLY APPEAR TO WALK WEST! HE IS WALKING BACKWARDS!!
..STILL WEARING THE BIG SHOES.. TRICKY DEVIL..
THE STORM HAS ERASED THE TRACKS.. HOW DO WE FOLLOW HIM NOW?
FIRST.. HE WALKS AROUND IN BIG SHOES TO DISGUISE HIS SHOESIZE.. THEN HE WALKS BACKWARDS.. NOW A STORM.. HE IS A CLEVER DEVIL..
FRED, RED★STAR DETECTIVE FIRST CLASS, IS HOT ON THE TRAIL OF LITTLEFOOT, THE RENEGADE PIGMY SASQUATCH... SCOURGE OF PETALUMA... AND LOWER MARKET STREET...
WASN'T HE THE ONE THAT ASSAULTED THAT CLERGY PERSON ON THE TROLLEY LAST WEEK?
THE REVEREND THOUGHT HE WAS KICKING A DISCARDED PAPER BAG, NOT KNOWING THE TINY RENEGADE WAS LURKING IN THE SACK..
A VICIOUS BITE TO THE ANKLE I HEAR..
THIRTY TWO TINY PUNCTURES.. VERY NEAT..
THE REVEREND WAS GIVEN A RABIES SHOT..
IF WE CONTINUE EAST, WE CROSS HIS TRAIL..
FIRST, WE FIND HIS CAMPSITE.. THEN WE'LL BUILD A TRAP!!
THE RED★STAR DETECTIVE MANUAL BELIEVES THE PROPER PROCEDURE WHEN PINCHING PIGMY PILFERERS TO BE A TRAP..
I THINK SOMETHING MOVED UP IN THOSE ROCKS..
SOMEONE ELSE IS AFTER LITTLEFOOT AND WE HAVE FALLEN INTO THEIR LITTLEFOOT TRAP!!??
NO.. THIS TRAP IS TOO BIG FOR A LITTLEFOOT TRAP...
FRED... THIS TRAP HAS ALL THE EARMARKS OF A RED★STAR DETECTIVE TRAP!
DON'T BE SILLY..
THE RED★STAR DETECTIVE MANUAL DESCRIBES THIS SITUATION ON PAGE FORTY TWO..
WE HAVE MERELY FALLEN DOWN A MINE SHAFT..
OH.. THAT'S A RELIEF..


OUR FEARLESS DETECTIVES FIND THEMSELVES AT THE BOTTOM OF A MINESHAFT... AND THINGS COULD GET WORSE ANY MINUTE!
NOW DON'T DISTURB ME!! I AM NOW ENTERING MY RED★STAR DETECTIVE TRANCE TO FIGURE A WAY OUT OF THIS MINE..
BE MY GUEST..
WHAT'S THIS? A NOTE?
PLEASE!! I'M TRYING TO SLIP INTO MY TRANCE..
..BEFORE YOU DO, I SUGGEST YOU READ THIS NOTE..
WHAT NOTE?
"MAKE YOURSELVES AT HOME, GUMSHOES.." -LITTLEFOOT"
"GUMSHOES!" OH, FOUL BLOW!! I'LL GET YOU FOR THAT, LITTLEFOOT!!
THERE'S MORE ON THE BACK.. "YOU AND WHO ELSE, FLATFOOT?"
Littlefoot does not like Red★Star Detectives!
THAT NASTY LITTLE PIGMY CALLED ME A GUMSHOE! ME! A RED★STAR DETECTIVE!!
..AND YOU DON'T EVEN OWN A PAIR OF SHOES.. HE SHOULD HAVE SAID "GUMFOOT".
WOW!
NOW THAT IS WHAT I CALL A HOSTILE PIGMY!!
WHAT DOES THE RED★STAR DETECTIVE MANUAL SAY ABOUT A TWENTY TON BOULDER IN THE DOORWAY?
I DON'T KNOW.. IT'S TOO DARK TO READ IN HERE..
HUGH.. I KNOW YOU FEEL WE ARE HOPELESSLY TRAPPED IN THIS MINESHAFT.. ..AND THE TWENTY TON BOULDER BLOCKING THE ENTRANCE UPSETS YOU.. ADMIT IT!!!
UPSET!! I'M PAST UPSET!! I AM NOW FACING HYSTERIA!
..SUPPOSE I TOLD YOU THAT I DELIBERATELY LED US INTO LITTLEFOOT'S TRAP.. AND THIS IS ALL PART OF MY MASTER PLAN TO NAB HIM??!!
TELL ME THAT AND I'LL PUNCH YOUR NOSE!!
..NOW THAT I HAVE YOUR UNDIVIDED ATTENTION..
LITTLE FOOT!!
..WOULD YOU CARE TO EXPLAIN WHY YOU TWO ARE FOLLOWING ME..?
..NOT REALLY.. NO.. ..SIR?
I WOULD IMAGINE THE TWO THOUSAND CHICKENS MISSING FROM THEIR COOPS DOWN IN PETALUMA DO NOT INTEREST YOU.. CORRECT..?
CHICKENS? WHAT CHICKENS?
DO YOU KNOW ANYTHING ABOUT CHICKENS, HUGH..
FRED.. I DESPISE CHICKENS!
LITTLEFOOT HAS THE RED★STAR DETECTIVES OVER A BARREL...
I'M SO GLAD YOU BOYOS AREN'T INTERESTED IN THE MISSING CHICKENS.
NOT US!!
WE HATE CHICKENS!
DON'T WE, HUGH?
YEP!
SINCE YOU AREN'T INTERESTED IN THE CHICKENS, I HAVE SOME GOOD NEWS FOR YOU.. BEFORE LONG, YOU'LL BE OUT OF THAT MINESHAFT...
WHAT? WE'RE LEAVING?
HOW? WHAT? WHEN?
YEP.. YOU SEE.. YOU'RE NOT IN A MINESHAFT.. YOU'RE IN A GEYSER!!
RUMBLE
WOOSH
I'LL GET HIM!! IF IT TAKES FOREVER, I'LL GET HIM!!


We leave Fred and Hugh, the Red Star Detectives to pursue Littlefoot into the dreaded Washoe Sink.
Panning back to Petaluma we see the..
..Batwinged Hamburger Snatcher..
..putting the rapid clutch on a furryhatted burger..
..All seems to be as it should in Petaluma
and yet..?
A cloudless winter night.. Sonoma County sleeps...and the Batwinged Hamburger Snatcher slides lazily through the ozone...
A bolt from the blue?
TEN MEGATONS OF HIGH JUICE HIT THE OLD COAST ROAD TO PETALUMA
..AND WHO IS THIS RISING FROM THE FISSURE...?
BLASTED FREE FROM THE BOWELS OF THE EARTH BELOW BODEGA BAY BY A MYSTERIOUS BOLT FROM THE BLUE... THE WERECHICKEN WALKS!!!
SKREEEEEEEE
SCCRRROWLLLL
THE WERECHICKEN IS WALKING EAST!! ...BUT WHY IS THE WERECHICKEN WALKING EAST?
REMEMBER THOSE 2000 PETALUMA CHICKENS CHICKENNAPPED BY LITTLEFOOT, THE PIGMY SASQUATCH? NO??!! YOU FORGOT!! SEE! IT'S TRUE! YOU YOUNG FOLKS HAVE NO ATTENTION SPAN!!
ARTISTIC SNIT NO. 47
ARRGGHHH THEY FORGOT THE CHICKENS!!
SNAP
..UH OH.. I HATE TO TELL YOU THIS, FOLKS. BUT THE AUTHOR JUST LEFT. THIS STORY IS ADRIFT..
SLAM!!
..YEP.. THE RED★STAR DETECTIVES, THE HOSTILE PIGMY SASQUATCH, THE BATWINGED HAMBURGER SNATCHER, THE WERECHICKEN, THE TWO THOUSAND CLUCKING CAPTIVES. ALL CONVERGING IN THE WASHOE SINK.. AND WE WON'T KNOW WHAT HAPPENED.. BECAUSE YOU YOUNG FOLKS FORGOT ABOUT THE CHICKENS.
AUTHORS ARE SENSITIVE..YOU FORGOT ABOUT HIS CHICKENS.. THEY WERE INTREGAL TO THE PLOT.. I'M AFRAID THE ONLY THING THAT WILL COMPEL THIS PARTICULAR AUTHOR TO FINISH THIS STORY IS FOR EACH ONE OF YOU READING THIS IMMEDIATELY GO OUT AND CONVINCE A FRIEND TO SUSCRIBE TO THIS MAGAZINE.. IF YOU ALL DO IT.. IT WILL DOUBLE THE CIRCULATION.. AND THE AUTHOR WILL GET PAID MORE..YES..IT'S TRUE.. CASH WILL SOOTHE HIM.. IT'S UP TO YOU!! REAGAN CAN'T HELP YOU NOW!
THIS STORY.. TO BE.. OR NOT TO BE... CONTINUED!!

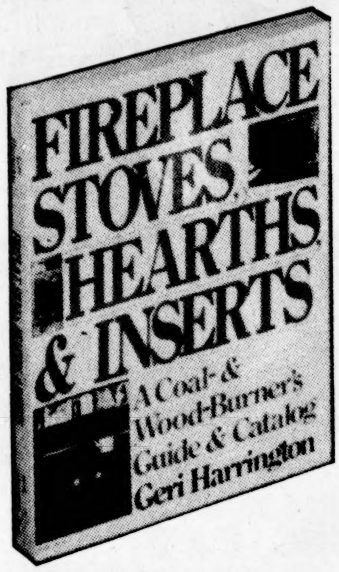
## Fireplace Stoves, Hearths and Inserts

*Not only does this book show hardware not seen elsewhere, it does so with a commendably forthright lack of manufacturer's hype. I'm glad to see this class of stove undergoing such vigorous development; for many people with existing fireplaces, an insert offers many advantages. This is also one of the few stove books that has an honest discussion of where the wood comes from, how to deal with coal, and what the pollution situation might be.*
*—J. Baldwin*

**Fireplace Stoves, Hearths and Inserts**
(A Coal- and Wood-Burner's Guide and Catalog)
Geri Harrington
1980; 178 pp.

**$8.95** postpaid from:
Harper and Row
Keystone Industrial Park
Scranton, PA 18512

or Whole Earth
Household Store


FIREPLACE STOVES, HEARTHS & INSERTS
A Coal- & Wood-Burner's Guide & Catalog
Geri Harrington

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SPECIFICATIONS
(Wells Inserta Furnace)
*Dimensions:* Various, depending on existing fireplace
*Materials:* 12-gauge inner box, 14-gauge outer wall, 1/8" grate material
*Shipping weight:* 225-250 lbs., uncrated
*Heating capacity:* 100,000 BTU's
*Warranty:* Workmanship unconditionally guaranteed
*Burn time:* 48 hours
*Approximate price:* $650

Wells Fireplace Furnace
Box 7079
Tucson, AZ 85702

The Wells Fireplace Furnace, designed by Bill Wells, clearly illustrates the danger in choosing a retrofit or built-in fireplace circulator by appearance alone; there is certainly nothing in the photograph to indicate that this unit can produce 100,000 BTU's (the retrofit) to 150,000 BTU's (the built-in), and hold a log fire for 48 hours. The heat production of this unit is attested to in a KBYU-TV news documentary (which is distributed to Public Broadcasting Systems, so you may have seen it) on energy efficiency. In this film, two Wells Furnaces are shown, in a public demonstration, heating a 5,000-square-foot home in Provo, Utah. The entire home was comfortably heated by these two units, installed in existing masonry fireplaces, and it was all done without blowers . . .

The Wells Fireplace Furnace will burn almost any kind of solid fuel — wood, wood by-products, and coal. The efficiency of the unit is most clearly indicated by the low ash production; the wood burns so completely that the ash cart needs to be emptied only a few times during the entire winter. Fixed grates dispense the ashes away from the fire, into a tray that covers the bottom of the firebox and is operated by a pull of a knob.

Another desirable feature of the Wells Fireplace Furnace is that it produces five times as much heat as a standard fireplace, using only one third as much wood.

## Heating with Coal

*For many people coal may be the best answer to non-solar home heating needs. Coal is a lot easier than wood to handle, store, and buy, and burns longer and hotter too. At this time it is cheaper and less likely to be in short supply. How to use coal is a forgotten art in many parts of the country, hence this book. The subject is well covered — everything, including pollution and available stove models, seems to be considered and illustrated. Warning: don't try to burn coal in your wood stove! That's tempting, but unsafe.*
*—J. Baldwin*

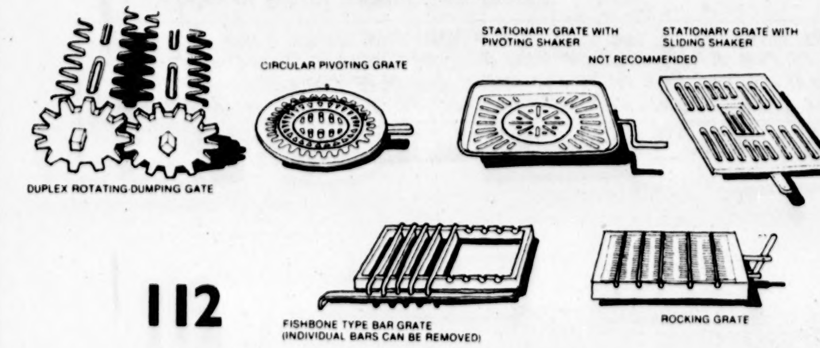
**Heating with Coal**
John W. Bartok, Jr.
1980; 188 pp.

**$7.95** postpaid from:
Garden Way Publishing Co.
Charlotte, VT 05545

or Whole Earth
Household Store

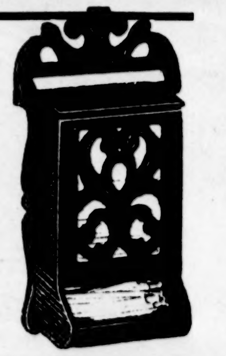
●

**Heat value.** This is the most important property of coal. It is made up of the fixed carbon and the volatile matter. The hard coals are almost pure carbon with very few volatiles. This gives a long, even burn cycle. Soft coals tend to be lower in carbon and higher in volatiles. This makes for easier starting and quicker pick up when the damper is opened. Total heat value is about the same on an ash-free basis. Lignite and subbituminous have lower heat contents because they contain less carbon.


DUPLEX ROTATING DUMPING GATE
CIRCULAR PIVOTING GRATE
STATIONARY GRATE WITH PIVOTING SHAKER
STATIONARY GRATE WITH SLIDING SHAKER
NOT RECOMMENDED
FISHBONE TYPE BAR GRATE (INDIVIDUAL BARS CAN BE REMOVED)
ROCKING GRATE

**Types of grates used in coal stoves**

## Cast iron match holder



I live in a cabin up in the hills. I have no electricity and depend, instead, on kerosene lamps. When I come home at night, the match holder hanging by the side of the door functions as a light switch, i.e. grab a match and light a lamp.

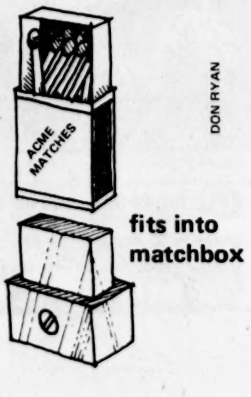
Up until a few months ago I used a plastic match holder for the wooden kitchen matches. Then a guest inadvertently dropped a still hot match back in the match box. Next thing we knew there was a glob of plastic and a pile of matches burning on our floor. I vowed never to use a plastic one again! I started looking for a cast iron one — no luck.

Finally I received a strange gift catalog (free from Spencer Gifts, 153 Spencer Building, Atlantic City, NJ 08411) in the mail. It advertised mostly worthless, plastic items, but — there it was — the cast iron match holder and only $4 (postpaid; order number C-78550).

Reta Rickmers
Clearlake Oaks, California

*Dear Reta,*

*Here's another idea that I've seen on a couple of yachts. You use those small boxes of wooden matches. Wherever you want a light switch, shape a wooden holder as illustrated and attach it.* *—SB*

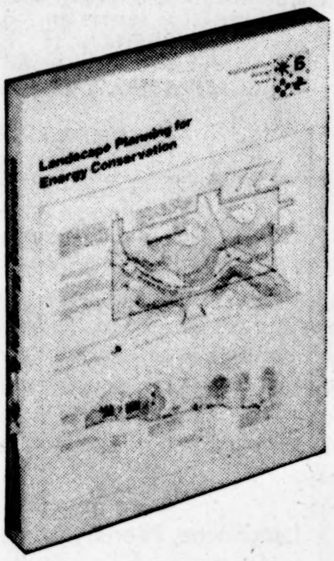


DON RYAN

## Landscape Planning for Energy Conservation

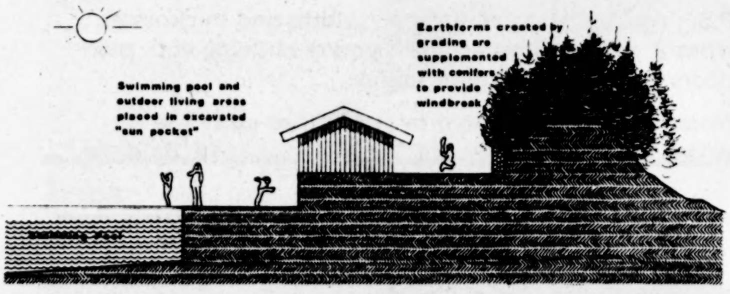
*Philosophically it's easy to see that energy can be conserved by well-designed landscaping, but what exactly works best? This book is Round One of the investigation. A lot of it consists of simulations by computer and wind tunnel. My experience has shown that such simulations may or may not be accurate representations of reality. Of course, in this case verification is the next step to take, and the book will be most useful for those who will be taking that step. The information is presented in a way that is not particularly easy to handle, unfortunately. Even the typeface and sharpness of illustrations seem to be a bit small for the task. It's a start though.*

*—J. Baldwin*


Landscape Planning for Energy Conservation

**Landscape Planning for Energy Conservation**
Gary O. Robinette and
Charles McClenon, Editors
1977; 224 pp.

**$20** postpaid from:
Environmental Design Press
P.O. Box 2187
Reston, VA 22090


Swimming pool and outdoor living areas placed in excavated "sun pocket"
Earthforms created by grading are supplemented with conifers to provide windbreak

## Solar Information Series

*The National Research Council of Canada is printing a series of books intended to help people with problems not well covered in the popular press. Among the best of the books are* **Corrosion Prevention in Solar Heating Systems,** *and* **An Assessment of Problems with Operating Solar Systems in Canada and the United States.** *Both books are modest, written in spare precise language that is easily understood, and illustrated with very clear photographs. (The photos in the corrosion book are in horrifying color and would do justice to a medical text on foul tropical diseases.) The photos make these books the best I've seen for field diagnosis, and they bring home strongly the point of making things right in the first place. These books represent a fine example of a government doing what it has the potential to do best: help the citizens be better citizens by disseminating hard-to-find information.*

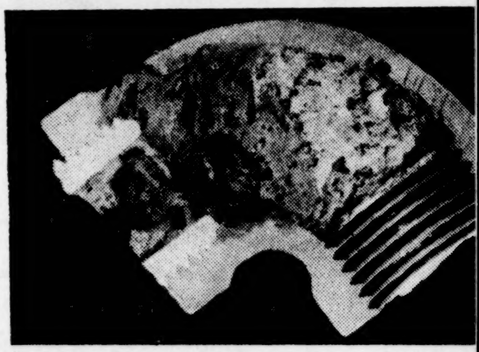
*—J. Baldwin*

**National Research Council Canada Solar Information Series**
No. 1: An Assessment of Problems Experienced with Operating Solar Systems in Canada and the Northern United States
Doug Lorriman
1978; 75 pp.
(Order No. NR42-6/1)

**$5.70** postpaid

No. 2: Corrosion Prevention in Solar Heating Systems
Michael Glover, Editor
1979; 42 pp.
(Order No. NR42-5/2)

**$3.60** postpaid
both from:
Canadian Government Publishing Centre
Supply and Services Canada
Hull, Quebec, K1A 0S9
Canada



**Longitudinal section of brass bushing connected to a galvanized elbow. The end of the galvanized elbow nearest to the brass bushing has been eaten away almost completely by galvanic corrosion. Notice the rust build-up in the elbow.**

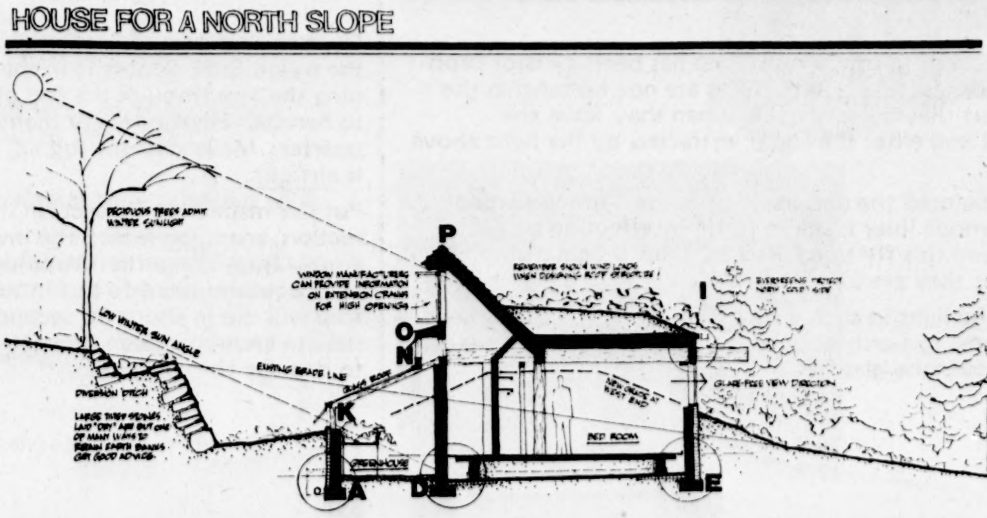
## Underground Plans Book-1

*Malcolm Wells, aided by his son who is also an architect, takes us for an adventurous tour of 8 "underground" houses that could be built now. The designs are not detailed for any specific locale — you'll have to do that yourself. But the general details are there, and the usual Wells imagination is too. Even if sub-surface housing doesn't particularly interest you, the comments and justification of the decisions that shaped these designs may well prove fascinating. It's likely you'll give the book more than one glance; its floppy 11" x 22" size makes it difficult to put on a shelf to be forgotten.*

*—J. Baldwin*

**Underground Plans Book-1**
(8 large-scale plans and details you can use in designing a house for your site)
Malcolm Wells and
Sam Glenn-Wells
1981; 44 pp.

**$13** postpaid from:
Malcolm Wells
P.O. Box 1149
Brewster, MA 02631
or Whole Earth Household Store


HOUSE FOR A NORTH SLOPE
DECIDUOUS TREES ADMIT WINTER SUNLIGHT
P
WINDOW MANUFACTURERS CAN PROVIDE INFORMATION ON EXTENSION CRANKS FOR HIGH OPENINGS
REMEMBER SNOW & WIND LOADS WHEN DESIGNING ROOF STRUCTURE!
I
EVERGREENS PROTECT NORTH (COLD) SIDE
O
N
LOW WINTER SUN ANGLE
EXISTING GRADE LINE
GLASS ROOF
NEW GRADE AT WEST END
GLARE-FREE VIEW DIRECTION
DIVERSION DITCH
K
LARGE TIRED STONES LAID "DRY" ARE BUT ONE OF MANY WAYS TO RETAIN EARTH BANKS GET GOOD ADVICE
BED ROOM
GREENHOUSE
A
D
E

## Solar energy map

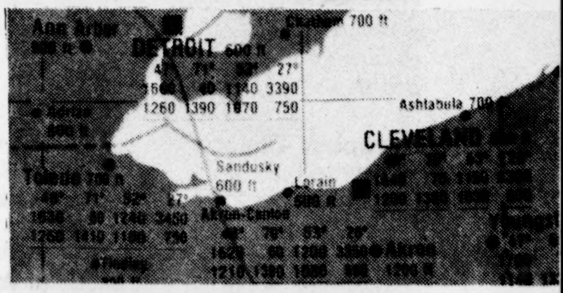
*A nice big (30" x 47") colored map of the U.S.A. and parts of Canada showing the availability of solar energy. Other information such as degree days are shown for 240 cities. The entire presentation is easy to understand.*

*—J. Baldwin*

**Solar energy map**
1980; 30" x 47"

**$11** (rolled)

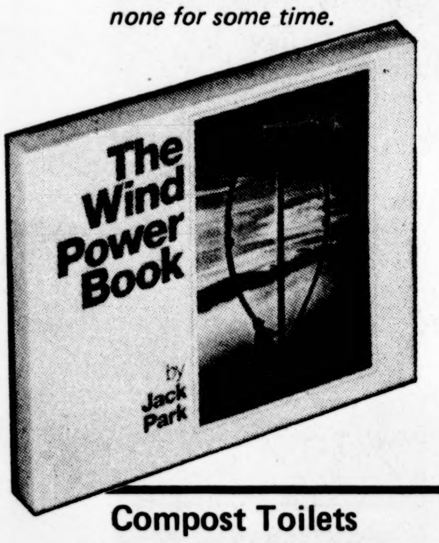
**$10.50** (folded)
both postpaid from:
ENMAP Corporation
P.O. Box 4430
Boulder, CO 80306


Ann Arbor
DETROIT
Ashtabula
CLEVELAND
Sandusky
Lorain
Toledo
Akron-Canton

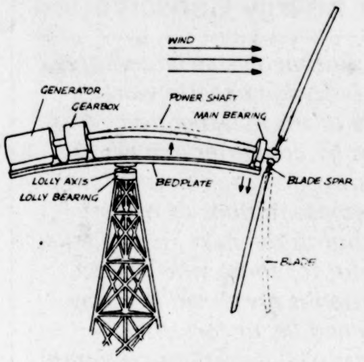
## The Wind Power Book

*In any discipline where there are many individuals working at the frontier, there is a need for information that is above the introductory level yet still accessible and useful to those without advanced degrees. Wind experimenters have had to struggle along; even Jack Park's previous and admirable books (***NWEC*** *pp. 197-198) covered only a small segment of the subject. Now Jack has come through with the most complete and usable book available on the subject of wind power. It's aimed, rather accurately, at the experimenter and build-it-yourselfer. Theory is covered in a simplified way that will enable an intelligent person to design a machine or other aspect of a wind system, but this book does not take the place of a mechanical engineer's education. You'll still need an engineer for the final calculations; and Jack tells you which numbers are critical. The only nit I'd pick is that it would be nice to have more detail; specific brand names and suppliers indicated where appropriate. The publisher tells me that as response to this book comes in, a revised edition will incorporate the field knowledge. That'll be frosting on the cake. As it is,* **The Wind Power Book** *stands without competition and probably will have none for some time.*

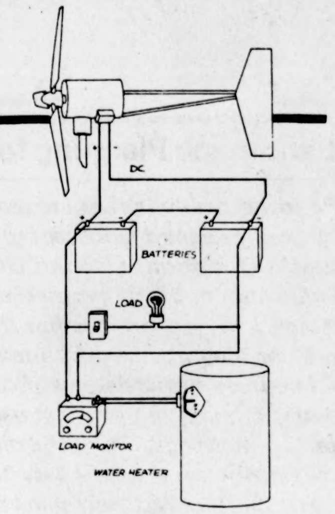
*—J. Baldwin*



**The Wind Power Book**
Jack Park
1981; 256 pp.
**$12.95** postpaid from:
Cheshire Books
514 Bryant Street
Palo Alto, CA 94301
or Whole Earth
Household Store



**Various bending loads on a wind machine. Wind and gravity cause static loads; dynamic loads are caused by variations in windspeed.**



**Series battery wiring with a load dumper. When the load monitor senses an overcharged battery, it diverts current to an electric water heater.**

## Cheap foam stripping

Finding that a roll of "Open-Cell Foam Weather Stripping" ran $2.75 for a skinny ½" x 10' at the old True Value I went to my favorite fabric store and bought 14 sq. ft. for the same amount and did all the openings in my house with high-quality, squishy foam. Cut it into strips with scissors using a chalk line to keep me straight and a stapler or construction adhesive in my caulk gun for application. Saved lots of money.

John Benecki
Langhorne, Pennsylvania

P.S. You can also get different widths and thicknesses from 2' x ¼" and up — nice if you're building your own doors and they are a mite strange...

*Note: Most foam is eaten by sunlight so don't use it where the sun regularly hits.* *—J. Baldwin*

## Compost Toilets

*Much of what has been written about composting toilets has many of the attributes of what composting toilets compost. This booklet is an honest look at the situation and makes no attempt to hide the fact that such devices must be attended in sometimes obnoxious ways. If you are thinking about installing one, the information shown here will help you decide if you need one, if you can use one, and if you want one. Many available designs, both commercial and home-built, are discussed in detail with particular emphasis on safety, operating procedure, and other detailing not found in "here's the answer to sewer problems" media.*

*—J. Baldwin*

**Compost Toilets**
(A Guide for Owner-Builders)
Robin Billau Adams,
Jon Averill and
Ida Daniels
1979; 54 pp.

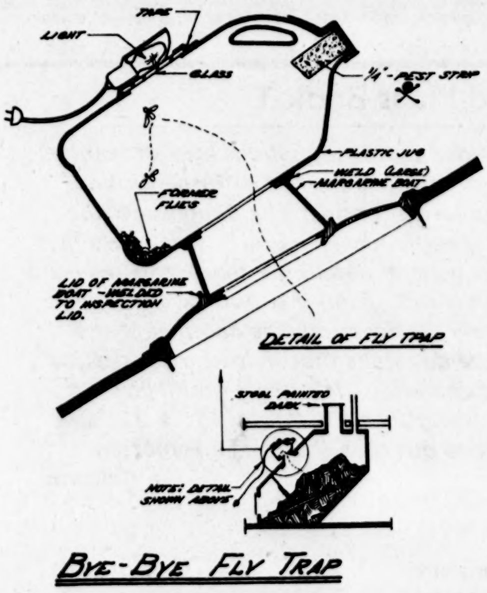
**$2.60** postpaid from:
National Center for Appropriate Technology
P.O. Box 3838
Butte, MT 59701
or Whole Earth
Household Store

●

Infestation by germ-carrying flies has been a major problem of composting toilets. Flies are not harmful in the toilet, but they cause trouble when they leave the compost and enter the room, attracted by the light above the seat.

So: We painted the underside of a Toa-Throne seat and the commode liner black as to limit reflection of light, then added this fly trap. Result: the flies are not all dead, but they are under control.

Mount the light in such a way that it will not burn the jug or tape, but only touches the glass. (Taped or suspended over the glass.)



Quarter a no pest strip. Put a small hole in it, thread with the nylon line. Secure it in the mouth of the jug by running the line through the top of jug as pictured, and tie to handle. Replace every month with a fresh no-pest quarter. Make sure the jug lid, like everything else, is airtight.

Put the inspection lid section in place, then attach trap section, snapping it into the inverted container lid. To empty trap, shake flies from jug. Flies may be too chemically contaminated to put in toilet.. Flies entering the trap will die in about 30 seconds. The strip will not radiate enough poison into the chamber of the toilet to damage the compost.

## Carpentry

*Herein is probably the answer to that oft-asked question: "I wonder how the hell a professional carpenter would solve this obviously common problem?" As is usual with instructional texts, most carpentry books give the basics but not those little touches that enable you to do an excellent job. (I have always suspected that the authors subconsciously don't want your competition.) This book is nothing but the tricks, and they're lavishly illustrated by 400 drawings by none other than Malcolm Wells. (***Underground Designs**, etc; he gets around.) The nastiest problem for most builders is keeping things plumb, square, and otherwise lined up so as to prevent that trapezoidal closet, or worse. There's a lot here about just that — enough to make the book indispensable for most of us. There should be a book like this for every profession.*

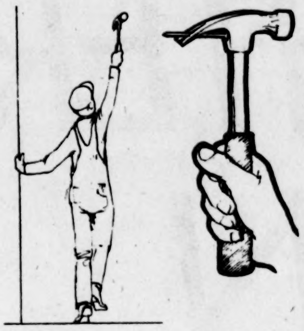
*—J. Baldwin*

**Carpentry**
(Some tricks of the trade from an old-style carpenter)
Bob Syvanen
1980; 100 pp.

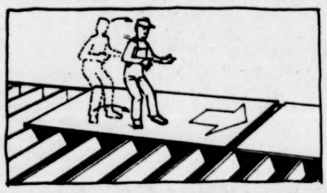
**$6.95** postpaid from:
Bob Syvanen
179 Underpass Road
Brewster, MA 02631

or Whole Earth
Household Store

$4.95
CARPENTRY:
SOME TRICKS OF THE TRADE ...FROM AN OLD-STYLE CARPENTER
BOB SYVANEN
OVER 400 ILLUSTRATIONS
ILLUSTRATED BY MALCOLM WELLS



EVERY ONCE IN A WHILE THERE IS A TIME WHEN A NAIL MUST BE LOCATED TOO HIGH OR TOO FAR FROM THE WORK PLATFORM, TO BE REACHED WITH BOTH HANDS (ONE FOR HOLDING THE NAIL, ONE FOR THE HAMMER). IT CAN BE REACHED IF A NAIL IS TUCKED IN THE CLAWS OF THE HAMMER WITH THE NAIL HEAD AGAINST THE HAMMER NECK AND THE NAIL POINTING OUT. SOME HAMMERS ACCEPT A NAIL THIS WAY BETTER THAN OTHERS. WEDGE THE NAIL IN AND IT SHOULD STAY. THEN REACH UP AND START THE NAIL WITH A SWING. ONCE IT'S HELD FIRMLY BY THE WOOD, THE HAMMER IS REVERSED AND THE NAIL DRIVEN HOME.



ADJUST PLYWOOD SHEETS BY JUMPING UP AND IN THE DIRECTION THE SHEET SHOULD GO. AS YOU LAND DRIVE FEET IN THE DIRECTION OF MOVEMENT. VARY INTENSITY OF MOVEMENT BY VARYING EFFORT. SMALL EFFORT LESS MOVEMENT

## Blackboard paint

It seems silly but the idea just came to me that a lot of people may not know about blackboard (or more accurately now, chalkboard) paint. It comes in a variety of colors, goes on like ordinary paint, and makes any smooth hard surface into a chalkboard! We do whole doors and panels where frequent notes to ourselves are handy. The surface is a nice soft matte color. They also use it for the surface on ping-pong tables — the slight "tooth" makes the ping-pong balls grab. Most paint companies have a line of the stuff. Needs to be mixed well and laid on as smooth as possible.

Bruce McDougal
Big Creek Pottery
Davenport, California

## Triok

*If you do much sheet metal work, the bill at the local tin-knocker's soon gets out of hand. Relatively inexpensive sheet metal working tools are hard to find. This one is unusually capable and reasonably priced. It'll handle 20 gauge steel up to two feet wide.*

*—J. Baldwin*

**Triok**
(All-purpose sheet metal forming machine)

**$1000** (approx.)

Catalog

**free** from:
Pacific One Corporation
410 West Coast Highway
Newport Beach, CA 92663

●

**4 machines in one!**

SHEAR . . . Cuts full 24" width of 20 gauge mild steel or equivalent.

PRESS BRAKE . . . Complete with sectional fingers allowing box and pan work up to 24" wide by ¼" increments.

SLIP ROLL . . . Uses 1½" diameter rolls provided with wire forming grooves.

NOTCH . . . Contains special 90° corner notching blade for fast preparation of sheet stock for boxes, shields or a variety of work.

Quick set micrometer back gauge for fast, accurate adjustments.

## Modern Welding

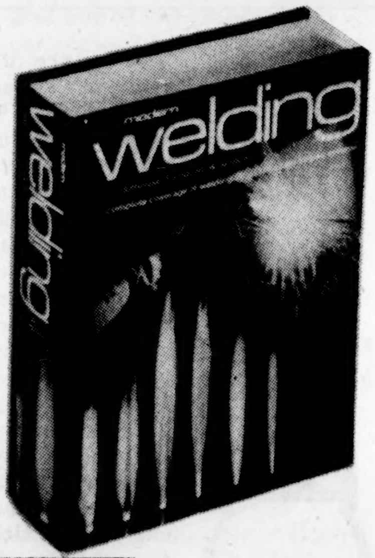
*We've shown very fine gas and arc welding books before (**NWEC** p. 164), but this one has all the techniques, including those for plastic and other relatively new specialties. It's a textbook with questions at the end of each chapter, but don't let that scare you — the writing is much better than the typical instructional soporific.*

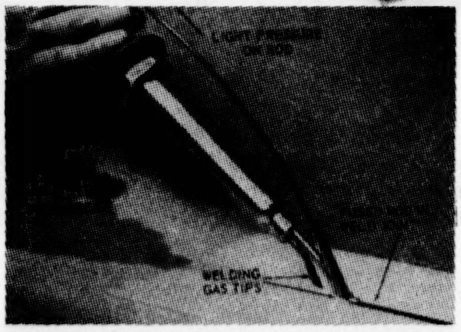
*—J. Baldwin*

**Modern Welding**
(Complete Coverage of the Welding Field in One Easy-to-use Volume)
Andrew D. Althouse, Carl H. Turnquist and William A. Bowditch
1980; 752 pp.

**$16** postpaid from:
Goodheart-Willcox Co.
123 West Taft Drive
South Holland, IL 60473

or Whole Earth
Household Store





**Speed welding torch being used to weld a plastic butt joint**

# LIGHTER THAN RAIL

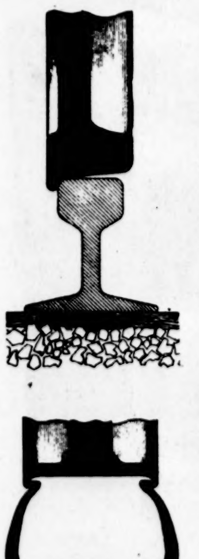
### by Witold Rybczynski

*A provocative article called "Light Rail — How to Make It Work" by Christopher Swan appeared in the Spring 1980* **CoEvolution.** *It proposed a number of convivial innovations, including concrete buried ties, locomotive in the center of the train, lighter construction, and link-up with local van commuter nets, but it remained attached to the tradition of two-rails-on-ground for roadbed.*

*Witold Rybczynski, long of McGill University in Montreal, is an old hand when it comes to soft technology design (***The Ecol Operation** *and* **Stop the 5-Gallon Flush***) and healthy soft technology iconoclasm (especially his recent* **Paper Heroes — A Review of Appropriate Technology,** *1980, Doubleday, $4.95). This is his assessment of how to make light rail work even better.* *—SB*

I AGREE with Christopher Swan's main point that public transportation needs to be revived, if not resurrected, and that trains are a particularly appropriate means to this end. I do have some reservations about the "technological obstacles" though; I believe that Swan has underestimated the advances that need to be made. I realize that his article was not primarily technical, so perhaps my own might be seen as complimentary rather than argumentative.

An illustration (Fig. 1) that appears in "Light Rail" requires comment. It shows a flanged wheel and track, and a pneumatic tire (incorrectly referred to as an automobile tire, whereas in fact there are trains with tires). Be that as it may, the flanged wheel is compared favorably with the tire (the train, as all we New Class know, being superior to the car), and one of the main disadvantages of conventional railroad technology is neatly disguised. In fact, there is little that is precise or energy efficient about the flanged wheel; it is, if anything, a comparison between high heels and running shoes; the conventional train is a '50s blonde, tottering on spiked heels — what is required today is a jogger on Adidas rubber soles. Let me explain why.



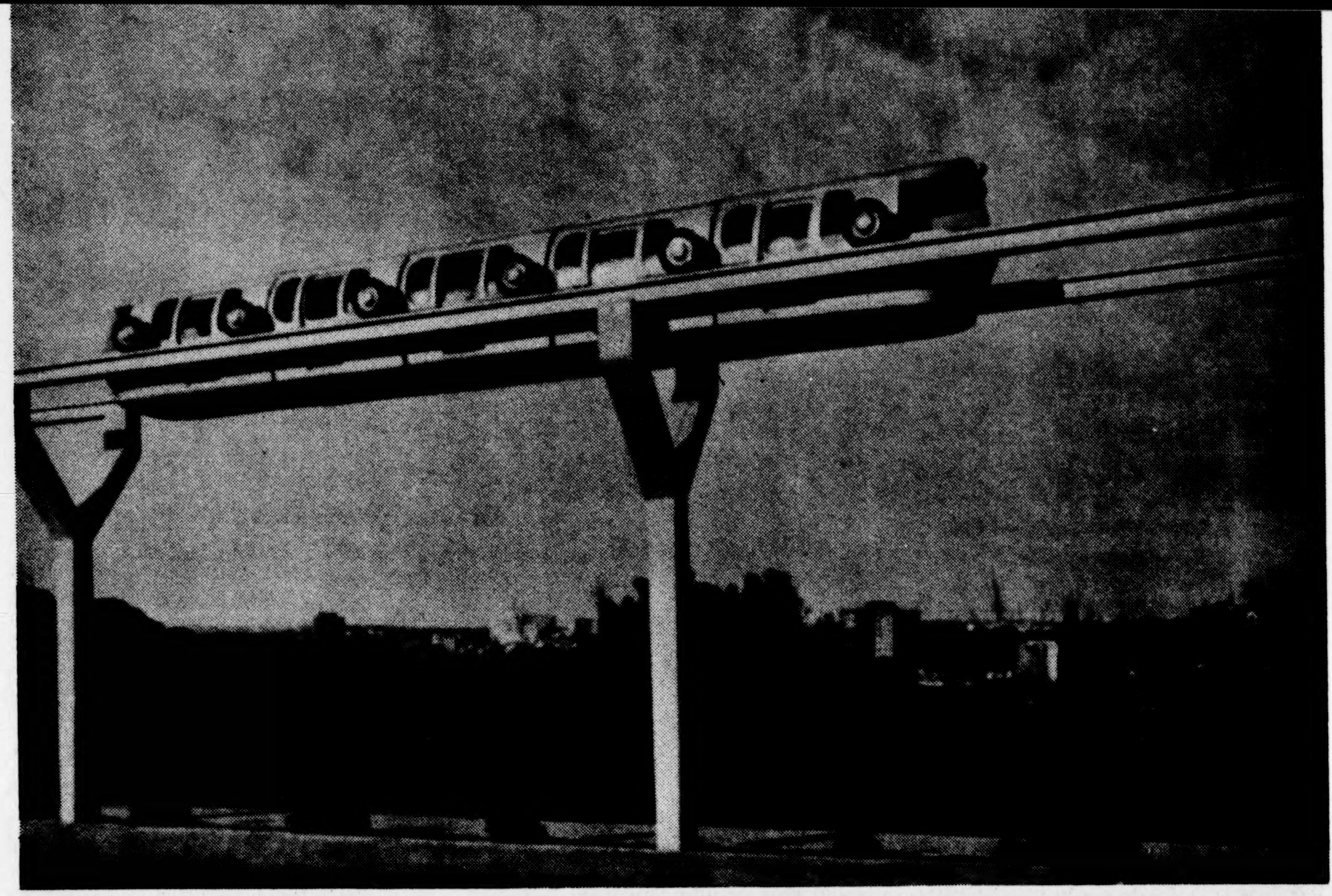
**The essence of the railroad's advantage. Note that the steel wheel is only contacting the rail on a relatively narrow area — about the area of the first joint in the thumb — while the automobile tire contacts the road over a much broader area — at least 25 times more contact area than the railroad. Also the steel wheel on steel rail is inherently less "sticky" than the tire. Given the fact that the rail vehicle is steered by its medium, it does not require a wide swath of material to ride on and instead it operates within a very precise corridor.**

**Fig. 1**
**This illustration which purports to show the advantage of the traditional flanged wheel and track over the pneumatic tire actually illustrates the opposite: pneumatic tires are superior to steel rims, concrete roadbeds are considerably cheaper than steel tracks, and the concentration of loads on wheel, track, and track bed is less an advantage than severe limitation on the conventional train.**

The problem with flanged wheels, and hence with conventional railroad technology, arises because the Victorian train, and I use that adjective to emphasize how antiquated this technology is, depends on sheer weight to stay on the tracks. Since the center of gravity of the car is considerably higher than the axle (the center of gravity of the wheels), a train going around a curve, even a banked curve, has a tendency to tip. Imagine a London double-decker but going through a hair-pin at high speed and you can begin to appreciate the difficulties. What keeps the train on the tracks is only its weight. At the same time the fixed axle design creates a further inefficiency, for, as the train goes around a corner, the wheel on the inside travels less distance than the wheel on the outside — the result is that the inside wheel wants to "climb" the rail. What holds it onto the track? Only the weight of the car.

Train designers have grappled with these problems from the very beginning. One way to mitigate, though not to solve, the problem of the high centre of gravity of the train is to adopt a wider wheel base. Just as an American van is more stable than a VW bus, so wider gauge cars are more stable than narrow ones. In addition, the car can also be lowered between the wheels, thus lowering the centre of gravity. One of the earliest British trains, built by Isambard Kingdom Brunel in 1835 and running between London and Bristol used a track gauge of seven feet. It was Brunel's hope that this gauge would be adopted as the British standard, but he suffered one of his rare setbacks; his line was rebuilt to a 4'-8½" gauge in 1892. The extra cost of right-of-way, bridges and tunnels were as discouraging then as they are today.

The result of the heavy conventional train is that everything needs to be overdesigned. Locomotives, cars, and of course, tracks, bridges, etc. need to carry the extra load. The climbing effect of the inside wheels loosens an and wears out both wheels and tracks. The spikes of the track under the famous Japanese Tokaido express train are refastened every night for precisely this reason. The heavier cars need larger locomotives, which



*Tren vertebrado Espanol – version elevada.* **Elevated version of the Spanish "vertebrate" train designed by Alejandro Goicoechea. Running on rubber tires on a level with the train's center of gravity, it can be a fraction of the weight and cost of conventional trains.**

weigh more, which require heavier bridges, and so on. Is it any surprise that this "mechanical mistake" has created a mode of passenger transportation which, while appropriate to the winning of the West, is now running at a deficit in virtually every country of the world?

Without minimizing any of the social or political issues that Christopher Swan raises in his article, and, I hope, without being accused of proposing a simple-minded technical-fix, I would like to suggest that the limitations of conventional rail technology are at least in part to blame for the current ***malaise***.

There have been a number of attempts to overcome the problems associated with the flanged wheel, that is, how to get rid of it. Japan, Germany and France are probably in the forefront with trains that are air-cushioned (the French Aerotrain) or magnetically supported. What I would like to describe is a revolutionary transportation system, the vertebrate train, that has been built by Alejandro Goicoechea, a Spanish engineer who has worked in this field for 55 years, and who is also the inventor of the ***Talgo***, an articulated train widely used by the Spanish national railway.

Goicoechea, in the 1920s (he is now in his eighties), set himself the problem of improving the conventional train by overcoming its principal defects, the fixed axle, high centre of gravity and the flanged wheel. Weight, in his words (Buckminster Fuller has also emphasized this), is the enemy of economy. Goicoechea's first attempt was to solve the problem of the fixed axle; this resulted in the ***Talgo*** which has a number of interesting innovations stemming from the fact that each wheel is free and not attached to an axle. The ***Talgo*** dispenses with the individual railroad car; instead the entire train is one articulated snake. Each link of this chain consists of a car-shaped module, but surprisingly with only one pair of wheels situated at one end. The other end of the "car" is supported on the rear of the following "car," and so on until the locomotive. The result of these improvements is a dramatic lightening of the train; the ***Talgo*** weighs about half as much as a conventional train.

I have ridden the ***Talgo*** from Madrid to Malaga, and it is a smooth, fast ride, in spite of the fact that, unlike the Japanese express trains, the ***Talgo*** runs on unmodified tracks. The sideways motion that is characteristic of high speed trains like the Canadian Turbo (which has derailed a number of times) is absent in the ***Talgo***, and drinking a cup of coffee is not a perilous business.

There is one thing more about the Spanish train that is worth mentioning. It has to do with style.

The style of travel is interesting to observe. Railways, particularly in the nineteenth century, had a distinctive and original style which seems to have originated in the hand-crafted opulence of horse-drawn carriages (railroad cars in Britain are still called carriages, sometimes coaches), but they rapidly exhibited a character of their own. This genteel engineering is particularly visible in the great railway stations of Europe, enormous glass and steel sheds that combined fantasy with common sense. Steamships copied the railways at first, but they also evolved a distinctive and unique style. Indeed, the aesthetics of ocean liners in the 1920s were so powerful that they were adopted by a generation of architects that included Walter Gropius and Corbusier. It is interesting that, true to this pattern, the earliest passenger planes adopted the style of the immediately preceding successful transportation mode. The pilot was called captain, the front and back of the plane were "fore" and "aft," and one of the earliest large passenger planes (it was actually a flying boat) was called the Boeing Clipper. This too has changed, and though certain terms have persisted, plane travel has developed its own, post-nautical style, which owes more to Hugh Hefner than to Lindbergh or St. Exupery.

Contemporary trains have abandoned their traditional style, and, not surprisingly, they have usually imitated that of their most successful rival, the passenger plane. Most of the Japanese, Canadian and American trains resemble nothing as much as a Boeing 747 without wings (remember the plastic train in Richard Pryor's ***Silver Streak***?). This resemblance, actually a loss of nerve, is particularly visible in the interiors, which now have stewardesses, public address systems, and flip-down seat trays instead of dining cars. (The quality of railway food, once first rate, now likewise resembles airline

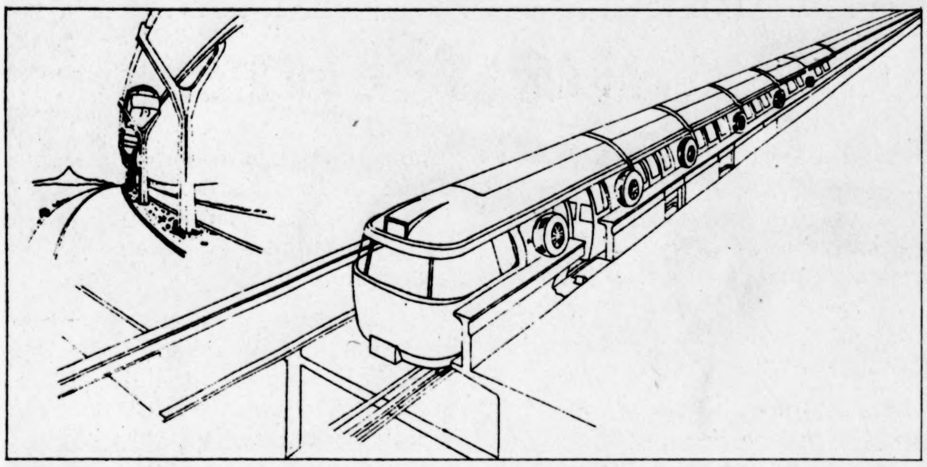


**Fig. 2**
**Views of the vertebrate train. The right hand illustration shows how sections of the track drop down, at stations, to permit access to the cars.**

fare.) Appropriately, many new trains are actually built by the aerospace industry.

To return to the ***Talgo***. What is impressive about it is the hint of a different style; it is modest and low cost, more like a subway than a train (though like the London subway, not the recreational vehicle systems of Washington or the Bay Area). The modesty of the ***Talgo*** may be due simply to economics – Spain is not a particularly rich country – or due to its designers, I don't know which. In any case, the common sense approach led to Goicoechea's greatest achievement: the vertebrate train.

The vertebrate train, likewise articulated, is a kind of elevated ***Talgo*** (see Fig. 2) and it has the clumsy beauty of all seminal inventions. It differs in a number of important respects from conventional trains. The wheels (without axles) are mounted at the center of gravity of the cars, much more like an automobile, and especially like a Formula 1 racing car. With a single stroke Goicoechea has cut the Gordian Knot which has constricted the development of more efficient and economic trains. Since the lines of center of gravity of the wheels and the car coincide, there is virtually no centrifugal force acting on the train in corners. It can be made as light as possible without any danger of derailing. Having dispensed with the need for weight, Goicoechea now turned his attention to making as light a train as possible. He eliminated the heaviest component, the locomotive, and replaced it with small electric motors that power each wheel independently. He reduced the length of the cars from 60 feet to 10 feet to further distribute the load. The results were dramatic: each wheel carried about one ton instead of the 6-10 tons carried by the wheel of a conventional train.

A further refinement could now be made; pneumatic tires replaced steel rims. Pneumatic tires for trains have been pioneered by the French in the Paris subway, and subsequently used in Mexico and Montreal. Although they result in a smoother and quieter ride, they have not found application in larger trains, which are too heavy. The lightweight vertebrate train, on tires, can achieve speeds of up to 125 mph in perfect safety – it is incapable of derailing.

It is no coincidence that the vertebrate train is a monorail. This type of train, now used in France, Italy and Japan, has many advantages. The days of building trains in wide open spaces (in spite of the CQ cover illustration) are long gone. The problem of building public transportation for medium and small distances (where trains excel) is precisely in congested and built-up areas – the inner city and the suburbs. Often this implies going either above or below ground. Both methods permit complete access across the right-of-way, though monorails are considerably cheaper to build, and, of course, much more pleasurable to ride in. The most serious disadvantage of the monorail has been the weight of the cars and the consequent high cost of the supporting structure. But whereas a Japanese Hitachi-Alweg monorail utilizes about 12 ft$^3$ of prestressed concrete beam per foot of track, the vertebrate train needs only 4 ft$^3$. The The smaller cross-sectional area of the vertebrate train likewise requires smaller tunnels (see Fig. 3).

The greatest payoff of truly light rail, apart from greater safety, is significantly lower costs. The new Washington subway is reported to have cost about $12 million per mile; the vertebrate train costs about $125,000 per mile. Obviously further savings are realized in operation, primarily as the result of energy conservation and lower maintenance costs.

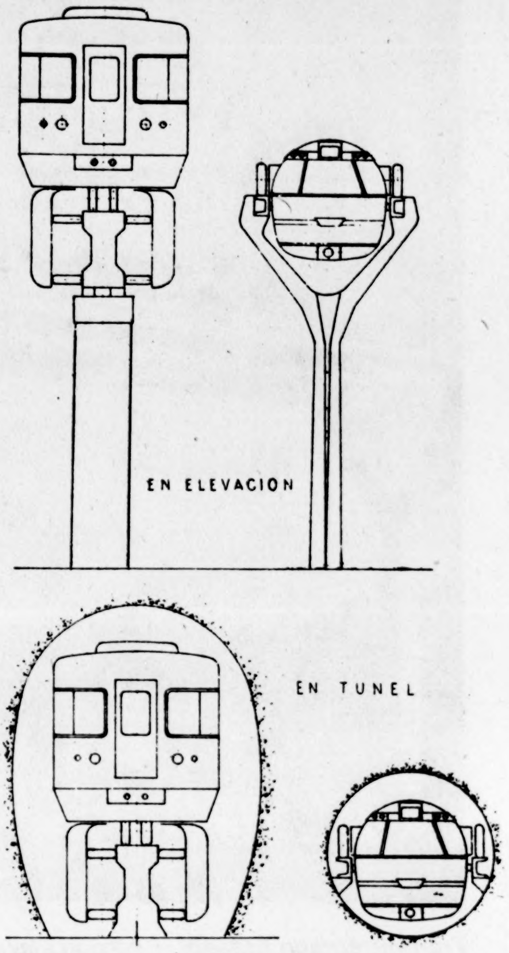


**Fig. 3**
**A comparison between the vertebrate train (right) and a Japanese Hitachi-Alweg monorail (left). The conventional monorail, whether supported from below, as here, or suspended from above, exerts significant centrifugal stresses on the track compared to the vertebrate train.**

What is the present status of the vertebrate train? The first prototype was built in 1969 – a 1300-foot stretch of monorail in an unused Spanish railway station. A 37-mile test section, recently demounted, was in operation in the Canary Islands, linking Las Palmas to the airport. A line is said to be planned in Caracas. Goicoechea says that it took over 20 years to convince the Spanish authorities to adopt the ***Talgo***, so it may still take a few years before the new train finds wider use. The only limitation to its adoption outside Spain is the tendency for rail systems to be national, if not nationalized, industries, and hence for train technology to develop within national boundaries. This is what seems to have befallen the ***Talgo***; it would be a shame if it happened to the vertebrate train. ■

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NOTE:
This article is based on information supplied by **S.A. de Trenes Vertebrados**, and on a talk by Sr. Goicoechea which I heard at the United Nations in 1974. A summary of this talk appears in **Strategies for Human Settlements: Habitat and Environment**, Gew Bell, editor, University of Hawaii Press (1976).
Thanks also to Alvaro Ortega who introduced me to the vertebrate train.

# J. Baldwin an ill wind, sez wind manufacturer

*Discouraging words on the subject of home-size wind power appeared on pp. 196-197 of* **The Next Whole Earth Catalog***, penned by J. Baldwin. "J. Baldwin's statements are almost word for word from a Lou Divone (Dept. of Energy wind head) speech at the last American Wind Energy Association. How is that?" wrote Randall Tinkerman, Projects Manager of EcoSystems, Inc. of San Jose, California. He went on:*

Dear Mr. Baldwin:

I take issue with your musings on windpower in the new edition of **The Next Whole Earth Catalog**, page proofs of which I read this morning. Your comments regarding cost and reliability of wind dynamos are not based on present day advancements in the state-of-the-art. The wind energy industry, so necessary to our energy survival in the '80s, will be set back greatly by your comments. There are wind dynamos available now which will be cost effective over the life of the system even in moderate winds, remaining reliable during that system's lifetime.

The vagaries in wind system economics are more than compensated for by two major benefits which you neglected to mention. First, front-end costs are eased by taking advantage of State and Federal tax credits. This gives you a first year "rebate" on your investment, and if you have financed your investment, you may actually have a positive cash flow the first year.

Second, under the new Public Utilities Regulatory Policies Act (PURPA) (what an obscene acronym), utilities are mandated to buy power from small power producers (wind, hydro, photovoltaic, other ) at avoided cost. Basically this means your utility will pay you more for the power they buy from your wind dynamo than what you pay retail for the power you buy from them.

Despite your contention that wind dynamos are unreliable and expensive, a quick perusal of the newer windplants on the market shows the availability of reliable, cost-effective machines now.

For example, Jay Carter Enterprises produces a wind dynamo with an installed price ranging from $20,000 to $40,000 depending on location and site (machine and tower, including power conditioning; $17,000). In a 12 mph wind regime (a very marginal wind regime) it will produce 3528 kwh per month, or $2116.50 per year at today's P.G. & E. prices. Over 20 years, your system pays $42,336. You've already made a profit, and you haven't even taken the tax credits yet. Then, given the possibility that electric rates may rise over the next 20 years, or double or triple for that matter, this system is unequivocally cost effective.

A detailed life-cycle cost analysis, including maintenance and operating expenses, cost of money, and property tax exemptions would give a more accurate picture. What is important to remember is that the above figures do not include rising prices for electricity, and even at this moment, the California Public Utilities Commission is considering new and higher rate tariffs, including some form of capacity payments. None of the above includes the per kwh cost of defending the Mid-East pipelines, avoided by the switch to renewable energy sources.

Testing over the past several years has proven the machine reliable, as well. There are a half-dozen manufacturers who can make similar claims, and another dozen not far behind. Some rather promising new entries will appear over the next year as well.

You have done a great disservice to the wind industry, and after all your support in the past, I don't understand it. The facts are public knowledge. The failures (and there are many) are well documented. No one knocked the early nuclear power industry even though their first machines were "bombs." The wind industry is coming of age right now, with products that are designed to provide renewable energy at a cost we can all afford. It's hard enough to fight among ourselves when it's warranted. The present status of windpower warrants only acknowledgment of how rapidly it is achieving its goals.

Best,
Randall Tinkerman
Projects Manager

# Prove it, sez Baldwin

*Dear Mr. Tinkerman:*

*Your innuendo that my* **Next Whole Earth Catalog** *comments on wind energy were lifted from Mr. Divone are not on target — I never heard of the man. But it is gratifying that someone with a wide view of the industry shares my sentiments. I do wish you'd started this dialogue with something other than an insult though, for there are some interesting points to be discussed.*

*I'll answer your letter by paragraph. I did not mention the benefits of tax rebates for several reasons. First, "the Lord Giveth and the Lord Taketh Away." The rebates were brought in with a single signature, and they can be taken away at any time the same way. Moreover, I personally think that using my tax money to pay for your wind turbine is the sort of thing the public is getting tired of. Records show that tax rebates generally operate as welfare for the rich. I do not think that a substantial 20 year investment should be based on such politically vulnerable edicts. I feel about the same way concerning the PURPA (ugh) laws. I expect significant changes there as more people come "on line" with wind and photovoltaics.*

*Twelve mph is not a "marginal" wind regime, rather it is higher than the average wind generally available to a majority of Americans. If wind machines are to achieve the high sales volume necessary for an affordable price, they must be able to put out high power in a 12 mph. wind. Most available machines will not, and most will not deliver a reasonable payback at that windspeed.*

*My figures show that most wind-electric installations today deliver power for 16 cents/kwh or higher. Not a good deal at this time, though it may be later. There is more to this matter than higher future utility rates.*

*If present machines are as reliable as you claim, why is the industry reputation so dismal, and why don't manufacturers offer 20-year warranties? I do not think that the reputation is due to a few bad apples, I think that most machines have simply not been developed into market-ready devices.*

*The reason is obviously lack of capital. I hate to say it, but small outfits may not be the best way to achieve widespread use of windpower. Something is very wrong when a relatively simple induction generator and a few blades cost as much as an Oldsmobile with its precision engine and gearbox, tires, glass, suspension, interior, electrics, smog controls, advertising budget, new-model change costs, crash testing, and extensive R & D. "Low produc-*

*tion" is the usual excuse given for high wind machine prices, but it is more complicated than that. It may take a large company to adequately develop and market wind machines at a reasonable price. Most well-developed rotating hardware in our society today sells for about $2.50 to $3 a pound. Some very exotic stuff and of course paying-for-the-name goods cost more, but that's not what we're talking about here. And it is necessary that the devices that use the wind plant's power be well developed too, as I pointed out. That has generally been ignored, resulting in what I call "solar Buicks." As Malcolm Wells has said, "A fool with a gadget will still behave like a fool."*

*So your contention that ". . . a quick perusal of the newer wind plants on the market shows the availability of reliable, cost-effective machines now" does not impress me. Where are they? Where are the records? Where are the numbers to back those claims? I don't mean catalog claims, I mean user experience. I don't think asking that question after ten years of talking is damaging to the industry. At worst it might be a goad. I've worked 25 years in R & D, and I think I understand what the problems are. I don't see many firms heading in what I consider to be a useful direction. I'll continue to say to anyone who cares to ask me, "Be careful how you spend that $20,000, especially now that photovoltaics are getting cheaper." Please don't hit me with Rocky Flats data; the tests there don't show long-term reliability, ease of maintenance, and what you can expect in kwh per year from an installation in Dayton year after year. Yes, there are a few good ones, if their required wind input and power delivered is acceptable to you, and you can afford them, and you can afford the risk that the company might fold next year. The industry must do better, sir!*

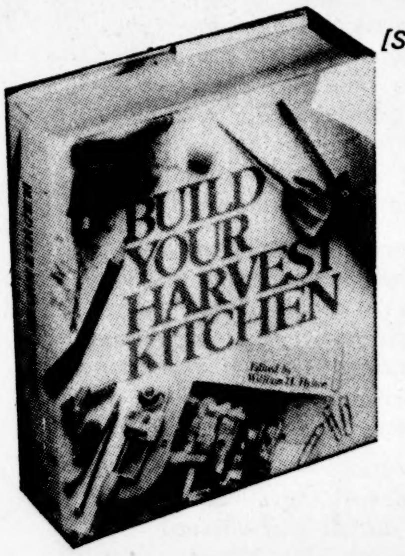
*—J. Baldwin*

## Build Your Harvest Kitchen

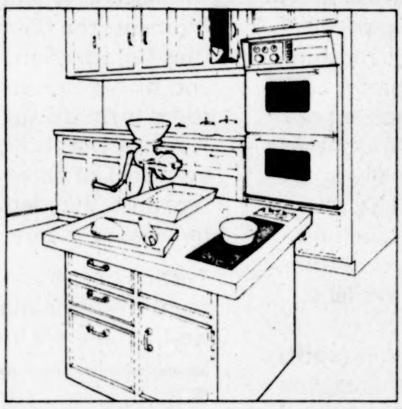
*Rodale Press here makes a creditable entry into the home remodelling field, long the domain of Sunset Books and more recently Reader' Digest (their outstanding* **Do-It-Yourself Manual** *is reviewed on p. 156 of the* **Next Whole Earth Catalog***). All of the jobs are here step-by-step — design, carpentry, wiring, plumbing, cabinet making — plus loads of plans for cabinets and accessories. And if you don't know the proper use of the hand and power tools needed, that's here too.*

*The goal of any how-to book for beginners is demystification, and the real message is: "You can play too." If you can only consume things that other people make, it gets boring. The skills available here to create for yourself exactly what's needed are a great antidote.*

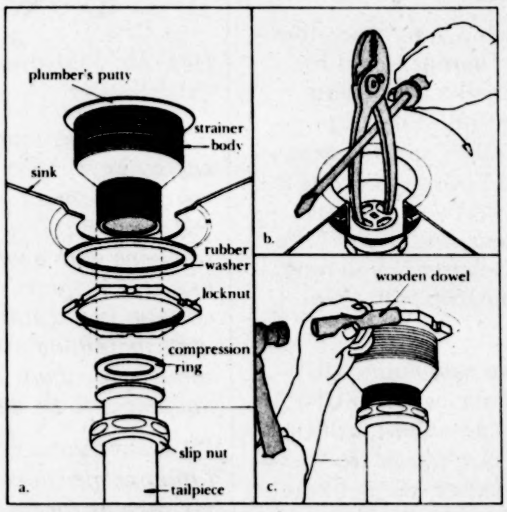
*—Richard Nilsen*
*[Suggested by Drew Langsner]*



**Build Your**
**Harvest Kitchen**
William H. Hylton, Editor
1980; 780 pp.
**$24.95** postpaid from:
Rodale Books
33 East Minor
Emmaus, PA 18049
or Whole Earth
Household Store



**A mini-bakery designed right into the kitchen provides ample space for preparation and baking, and keeps ingredients and equipment centrally located.**



**Installing a sink strainer: a. Fitting the washers and locknut over the strainer body once it has been seated in the sink. b. Holding the strainer body in place with the handle of a pair of pliers. c. Tightening the locknut by hammering it with a wooden dowel.**

## Government hazardous, expensive, sez adobe

Dear CoEvolvers:

Adobe, a building material used extensively in the Southwest, is cheap, easy to work with, made from local renewable resources (clay, straw, water, sunshine), and available to nearly everyone, is in danger of extinction. The Department of Housing and Urban Development (HUD) is questioning the energy efficiency of adobe, and has begun to require builders to insulate adobe homes and waterproof adobe bricks in government financed, low cost housing. If, as in the past, other regulators follow suit, adobe will become too expensive for use in many people's private construction.

The cost of conforming to federal regulations, according to a recent article in the **Wall Street Journal**, may add up to $20,000 to the cost of an adobe home.

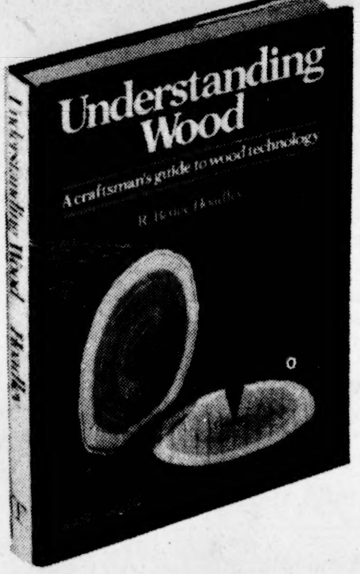
As if this isn't enough, the Davis-Bacon wage rate act is being applied to those laborers who mix and form crude adobe blocks. According to the act, these laborers must be classified as bricklayers and paid three times as much as other laborers.

The government has effectively stolen from the hands of the populace a beautiful and practical building material that has been in use for thousands of years. If this is the type of energy legislation we are going to be subjected to in the future, we are all in trouble.

Sincerely,
Richard W. Hayter
Inca Development Company
Tahlequah, Oklahoma

## Understanding Wood

*A superb book for wood craftsmen about wood, not woodworking. The author teaches wood technology, contributes to* **Fine Woodworking** *magazine, and has been carving the stuff since he was a kid. He has done a painstaking job of making accessible a lot of essential but technical information about what wood is (from cells on up) and why it acts as it does. It's the difference between knowing that a board can check and warp, and knowing why. The photos, captions, and design are equal to the fine text.* *—Richard Nilsen*



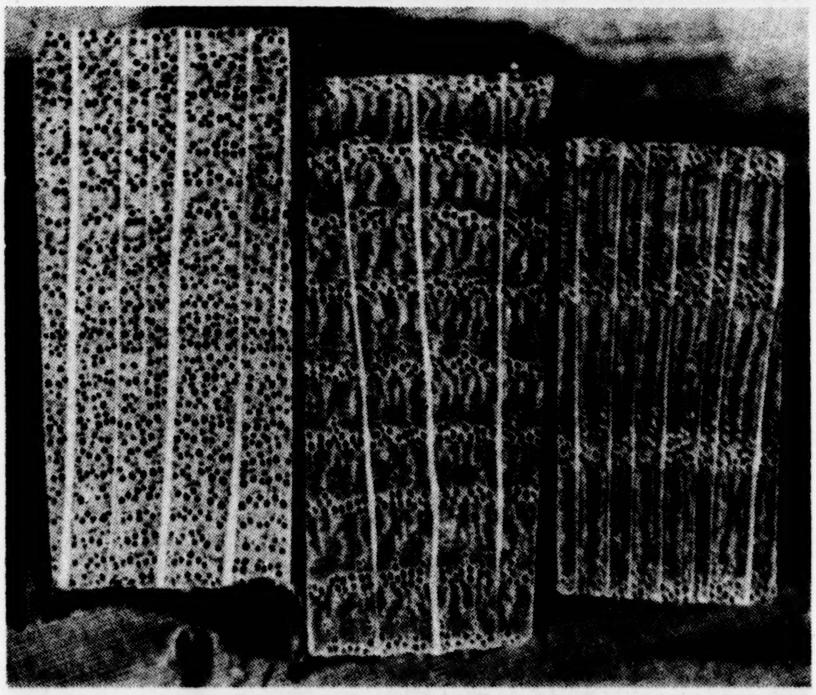
**Understanding Wood**
(A Craftsman's Guide to Wood Technology)
R. Bruce Hoadley
1980; 256 pp.

**$18** postpaid from:
The Taunton Press
P.O. Box 355
Newton, CT 06470
or Whole Earth Household Store

●

We in the United States consume wood at an annual rate of about one ton per person. This total tonnage exceeds the combined tonnage of all other materials. About half of that tonnage of wood is made into paper and related fiber products.

In our forests we can see an unfortunate tradition that prevailed in the past and persists even today: the practice of logging and relogging an area, each time taking the best of what grows there with no provision for the future. This has the tragic effect of selecting poorer and poorer residual stock, the inverse of survival of the fittest, with predictable results. When finally allowed to regrow, the forest must spring from the stunted and malformed trees that the loggers did not want, and a forest of the highest quality cannot result. Although unintentionally, the forest has been genetically degraded. In some parts of New England, it has been systematically degraded for 250 years.

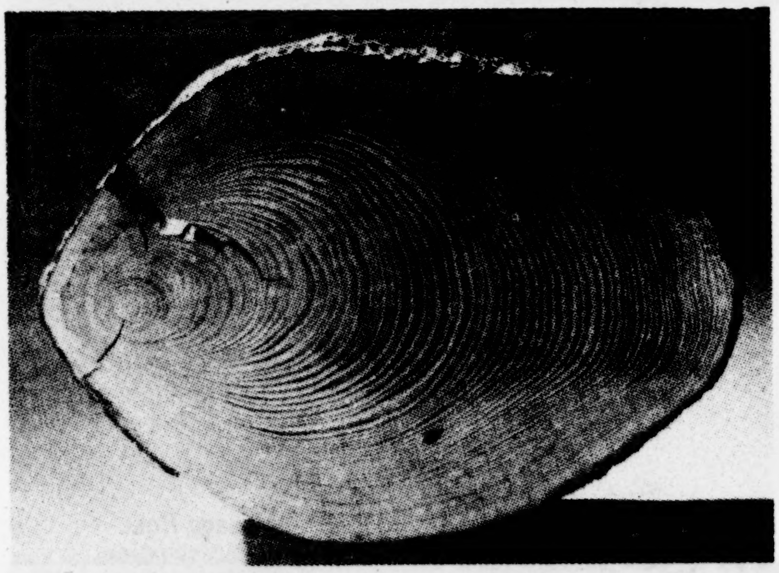


**In ring-porous hardwoods, the faster the growth, the stronger the wood. Compare slow-grown red oak, left and center, with fast growth, right.**

**End-coated half-log sections of eastern white pine are stickered and open-piled for slow drying.**

↑

To prevent rapid end-drying, which will ruin carving chunks and the ends of lumber, the end-grain surface should be coated. Any relatively impervious material (such as paraffin, aluminum paint or urethane varnish) in ample thickness will do nicely. End-coating can be applied to relatively wet surfaces by giving a primer coat of acrylic latex material first. It is important to end-coat as soon as possible after sawing, before even the tiniest checks can begin to develop. Once a check develops, the cell-structure failure will always be there, even if it later appears to have closed. Also, when normal drying stress develops, a small check can provide the stress concentration point for further failures, which otherwise might not have even begun in check-free wood. The purpose of end-coating is to force all moisture loss to take place from lateral surfaces.



← ↑

**Reaction wood forms in the trees that lean. The curving sweep of the tree although picturesque, means that unpredictable compression wood will be found within. This is pronounced reaction wood from leaning spruce.**

## Danner boots

*In Idaho, the cowpokes are wearing Adidas and stocking caps so as not to be taken for truck drivers or movie ushers or bank tellers or any of those shit-kicking, post-Travoltoid buckaroos in the black twenty-gallon chapeaus with half a dead ostrich and most of a Volkswagen bumper on the hatband. In the same spirit, I have given up the pointy-toed pull-ons I grew up in, and changed over to a good lace-up boot that won't hang up in a stirrup and will provide ankle support in case my Pontiac breaks down. I began by wearing White's (*NWEC*, p. 427) with a heavy waffle sole, which were great for traction in the snow, but hell on the neighbors' carpets in the spring and impossible to extract from a normal stirrup, so I changed to the White's packer model with a slightly treaded mini-Vibram that cost $125 and fell apart (the stitching rotted) after one winter working a feedlot. So I went to Danner's, mainly because they were 50 bucks cheaper and thereby more disposable, but I found, to my delight, that they look and feel just like the more expensive spread and last just as long under my wear patterns. So, I have settled into the Danner model #7693 (Packer Boot) and a good pair of five buckle overboots.*

*If you are not particularly enchanted with stirrups or Pontiacs, Danner might still have something for you. They make about 50 styles of boots, from urban walkers to calked logging boots. Of interest to me for my fantasy trek to the headwaters of the Orinoco are the Danner Lights at two pounds, 10 ounces per pair, which are vaguely patterned after the Nam jungle boots, but incorporate Gore-tex and Cordura, new fabrics, in place of the canvas duck (which might mildew and be a source of embarrassment to me in the presence of the chieftain's daughters).*

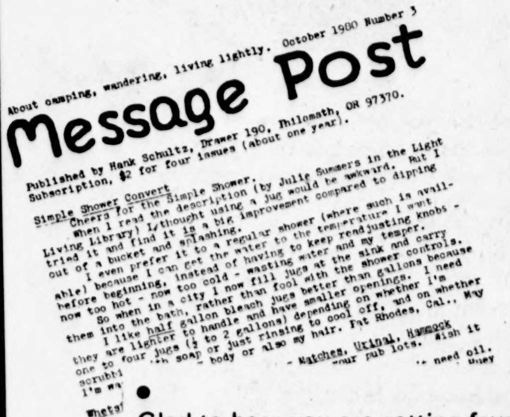
*If you don't mind wearing dead animal parts around your feet, and if you occasionally get off the parquet flooring and pavement out into the hillsides or shipyards, then look into this company's products. For you diehards, they even make a model they call the "Pull-on Packer" which looks to me to be smackdab in the middle of the pointy-toed tradition of Hoppy, Gene, Roy, and Ronald.*

—J.D. Smith

## Message Post

*This looks like the bugs' n' bears version of hints from Heloise. Down-home ingenuity "about camping, wandering, living lightly."*

—Stephanie Mills



About camping, wandering, living lightly. October 1980 Number 3

Message Post

Published by Hank Schultz, Drawer 190, Philomath, OR 97370.
Subscription, $2 for four issues (about one year).

Simple Shower Convert

Cheers for the Simple Shower.

When I read the description (by Julie Summers in the Light Living Library) I thought using a jug would be awkward. But I tried it and find it is a big improvement compared to dipping out of a bucket and splashing.

I even prefer it to a regular shower (where such is available) because I can get the water to the temperature I want before beginning, instead of having to keep readjusting knobs - now too hot - now too cold - wasting water and my temper.

So when in a city I now fill jugs at the sink and carry them into the bath, rather than fool with the shower controls.

I like half gallon bleach jugs better than gallons because they are lighter to handle and have smaller openings. I need one to four jugs (½ to 2 gallons) depending on whether I'm scrubbi

Pat Rhodes, Cal., May

- Matches, Urinal, Hammock

**Message Post**
(About camping, wandering, living lightly)
Hank Schultz, Editor
**$2** /year (4 issues)
from:
Message Post
Drawer 190
Philomath, OR 97370

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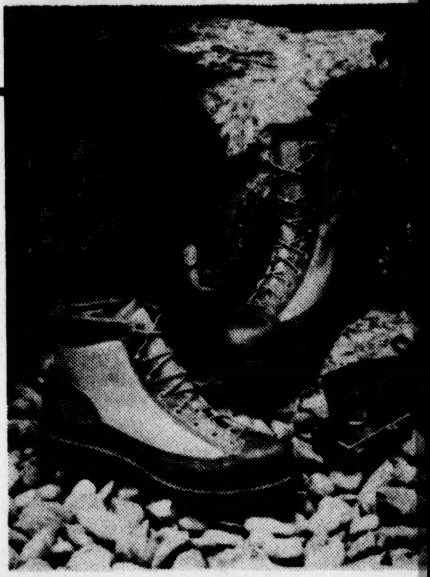
Glad to hear you are getting favorable responses to The Simple Shower. Along the same line there's the Easy Peepot — another refinement that puts more comfort in camping. It allows me to pee without bothering to leave my tent and put shoes on, and eliminates splashing pee off of hard ground. I use a coffee can, a large plastic food container, or whatever is surplus and has a tight-fitting lid. Men can use a plastic narrow-mouth jug.

I carry a portable bidet with me too — in the form of a plastic squeeze bottle. Fill with water. To clean just squirt and towel dry. Eliminates the need for toilet paper.

**#8066 Danner 'Light' →
made with Gore-tex
6 inch uppers. Vibram Kletter-Lift. Average weight per pair: 2 pounds 10 ounces. $94.**

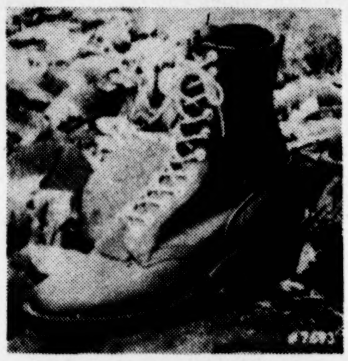
**#8068 Danner 'Light' —
made with Gore-tex
8 inch uppers. Vibram Kletter-Lift. Average weight per pair: 2 pounds 12 ounces. $100.**



**Packer Boots. Danner Packer Boots are well-made cowboy work boots with narrow toe and heels. These boots are designed in a lace-up style to give a close fit needed for comfort. They will give much more support than a standard cowboy boot.**

**Specifications: Red-brown Dynatan uppers, double leather vamps, brass stud hooks and eyelets, 9-½-iron leather insoles, steel shanks, 7-½-iron leather middlesoles, Vibram® Oil Resist soles and cowboy walking heels.**

**Model # 7693 Packer Boots: →
Average weight per pair:
4 pounds, 13 ounces. $86.**



**Danner Boots**
Catalog
**free** from:
Danner Shoe Mfg. Co.
P.O. Box 22204
Portland, OR 97222

## A boot story

*(heard in the McCall, Idaho, hospital, summer 1977)*

"Back in the '30s, I buckarooed for the ought-eight, down in the Snake River country one winter, where the lizards were glad to see you, the sun shined about two hours a day once a month, and cattle were half shadows from having to climb cliffs to get to the bunch grass. As I remember, the pay was $30 a month and all the cowshit you could eat, so it took the better part of a lifetime to save up for a new pair of boots, but somehow that winter I had made it all the way into Grangeville and bought a spanking new pair of black beauties with little red roses stitched into the tops.

"Now me and ol' Dogmeat, my cow pony, were ambling along one afternoon, trailing some heifers back down into the bottomlands, and I had a cigarette in my mouth and one leg cocked up over the saddle horn polishing my left boot with my snot rag when Dogmeat spooked at a prairie dog or something, and I come unseated with one leg hung up in a stirrup. Of course, the heifers spooked at me dragging along on the ground and they began to make tracks for the river and ol' Dogmeat, being the pony he was, just wasn't going to let the cattle get away, whether I went along or not, and he began to pour on the coal to catch the heifers, which left me bouncing along from boulder to boulder, until, almost halfway to the river, Dogmeat kicked me in the chest hard enough to pull my foot out of the boot that was hung up.

"Now I laid there feeling mighty sorry for myself for a long time, until I got to feeling like I should at least find Dogmeat, so I crippled the rest of the way down the hill and found him holding the heifers on a little sandbar, and you know, by God, right there in my stirrup was that right boot. Boy, was I lucky."

—J.D. Smith

**Tog 24 climbing jacket**

## High Technology

*Climbing today bears little resemblance to the sport of ten years ago, because of vast progress in equipment and wearing apparel. The slick camping and mountain gear catalogs overflow with hype. Steven Schneider, Director of the North Country Mountaineering School in Hanover, New Hampshire, and author of* **The Climbers' Source Book** *and* **Backpacking on a Budget**, *here sets the record straight with great descriptions and evaluations of the latest technological developments in mountaineering equipment now on the market — pitons, nuts, carabiners, harnesses, helmets, boots, ice tools, crampons, ropes, ascenders, packs, clothing, and sleeping bags. The coverage of selection, use, care, and maintenance of the equipment is alone worth many times the price of the book. Lots of photos. Many valuable climbing tips. Good humor. A commendable job in every way.* —*Bill Gifford*

**High Technology**
(A Guide to Modern
Mountaineering Equipment)
Steven Schneider
1980; 211 pp.

**$7** postpaid from:
Contemporary Books
180 North Michigan Ave.
Chicago, IL 60601
or Whole Earth
Household Store

↖

**Pile**

The British have been using fiber pile for warmth for a long time. Used originally by British seamen and fishermen, it was much cheaper and warmer than the traditional Irish-knit fisherman's sweater. Eventually, British climbers began using it, and it is catching on here, fast.

In Britain, the Tog Textral Manufacturing Corporation, Ltd., makes the Tog 24 pile-lined climbing jacket, with or without a hood. The Tog pile is the tightest and softest I've seen. It's an excellent jacket for crag climbing. When worn underneath a Gore-Tex outer jacket, it makes an extremely warm and waterproof combination for ice climbing. By itself it is a good all-around jacket. The outer surface of the Tog does not fuzz and pill as easily as some of the others.

Tog 24, Textral Manufacturing Company, Ltd., Unit 171, Walton Summit, Bomber Bridge, Preston, England, Preston 311787.

## Motor Auto Repair Manual

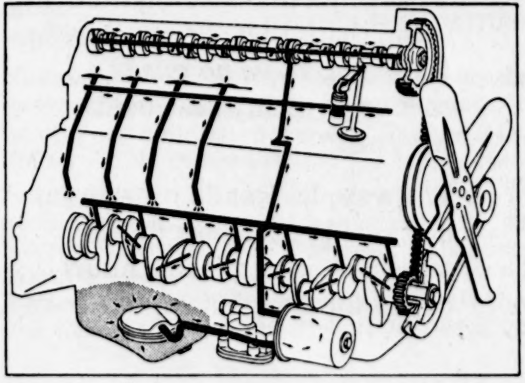
*Motor's manuals generally are found in small shop and backyard mechanic's bookcases, with the pages all fingerprinty, bearing greasy ghosts of the parts used as paperweights, and bound well enough to take an occasional "Aw shit" and slap across the fender when the little ball from the carb drops into the intake manifold.*

*This particular edition is geared toward those of us who figure the twenty-thousand bucks difference between a silver Mercedes and a brown Pontiac six will drive ol' Babe a long ways down the pike, even if we had the twenty thousand. It includes tune-up specs and wheel alignment for any American-made automobile from 1946 to 1967, and the whole ball of grease for 1968 to 1974 Detroiters, right down to a 50-page section on seat belt interlock systems (how to keep the buzzer from waking the kids if you figure you are smart enough to remember your own seat belt system). There are also sections on 1967 to 1974 tune-up specs and a good trouble shooting guide. Cayenne Ken Allard, the most patient mechanic I know, owns five or six Motor's manuals and a perpetual garbage barrel full of squashed Coors cans as testimony to the nice logical way Motor's presents its information.* —*J.D. Smith*

**Motor Auto**
**Repair Manual**
(Early Model
Edition 1968-1974)
Louis C. Forier, Editor
1979; 1224 pp.

**$17.95** postpaid from:
Hearst Books
P.O. Box 1406
Radio City Station
New York, NY 10019
or Whole Earth
Household Store

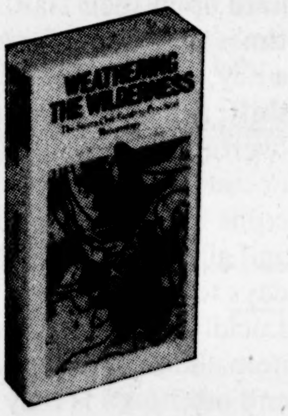
**Engine oiling system. Pontiac OHC Six.**



## Weathering the Wilderness

*This is the best book I've seen on U.S. regional weather. It is oriented towards the hiker but will serve anyone who wants to understand weather. The first half of the book covers theory — how is weather caused and what are the major influences on each region. The last half discusses in detail the year-round climate of eight high-use hiking areas in the country, telling what to expect and how to predict what might happen. A variety of charts adds to the informative nature of the manual.* —*Chris Winne*

**Weathering the**
**Wilderness**
(The Sierra Club Guide
to Practical Meteorology)
William E. Reifsnyder
1980; 276 pp.



**$9.95** postpaid from:
Sierra Club Books
P.O. Box 3886
Rincon Annex
San Francisco, CA 94119
or Whole Earth
Household Store

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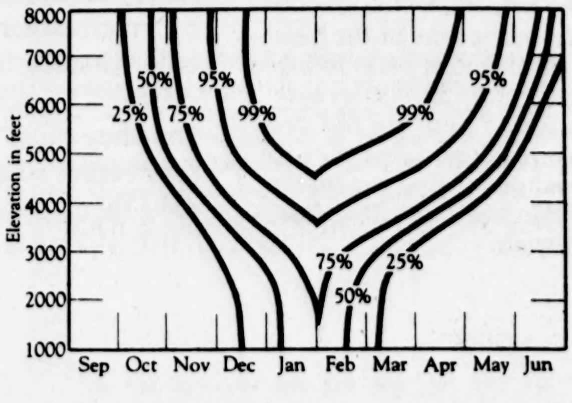
The ecological influence of the glacier wind can be discerned for a considerable distance below the toe of a glacier. Vegetation will be very sparse or nonexistent for a few hundred feet from the lower edge of the glacier; and vegetation will be stunted and deformed for much greater distances. Glacial winds can lower the normal timberline as much as 1500 feet. The glacier exerts a powerful influence on the vegetation through its modification of the microclimate.

**Probability of six-inch snowpack on indicated date. Northern Cascades**



THE INSECT SOCIETIES

# Eek
# Real ARMY ANTS in Real Colombia

### by Meredith Foyle

OF ALL THE BUGS and insects that get us down out here in the rainforests of South America – and they are legion – I guess the periodic invasions of "La Ronda," a species of army ant, are the most awe inspiring.

They begin with a few scattered individuals and then thousands upon thousands more following hard upon their trail. Sometimes they come for only half a day, others a full eight-hour shift, and still others run into overtime. On a couple of occasions the creatures have come intent on colonizing (eggs and all), and it has taken us days to rid the house of them. Luckily, army ants are more nomadic than imperialistic, and our house is only on their route once every six months or so. Neighbors say when La Ronda is on the move, it's a sign of rain. (We get 200 inches of rain a year.)

A Ronda invasion generally goes like this:

You first notice them – sometimes painfully, when a pair of strong mandibles digs into an unsuspecting finger or toe – in the scattered individual stage. At this point or very shortly thereafter, they are all over the floor (though usually only in a couple of parts of the house at a time), and it's a good idea to put on your shiny-clean high rubber boots – too slick for the them to climb – and/or high-tail it to a hammock while they get their act together. Because, oh! do they bite HARD! And they have that irritating charge of formic acid, making every foot-soldier her own chemical-biological warfare unit.

Swinging in a hammock, one has the leisure and the margin of safety to study the beasts as they work. As more and more ants arrive, orderly files take form and thicken. Thousands of workers – black of head and thorax with rusty red abdomens, all in varying sizes of small – scurry along, loosely supervised by much larger, faded rust-colored soldiers. These have outsized blackish serrated tusks, and they must carry their heads more erect so as not to trip over themselves.

What they are all after – aside from getting from one place to another via this complex obstacle, our house – is food. Ants are scavengers and hunters, and La Ronda sends crickets and cockroaches scuttling and whirring to get out of her path. She won't touch breadcrumbs; it's meat she's after. Actually, despite the grim numbers ratio, the prey insects have a fair chance of escaping. All they have to do is avoid confrontations and be in the right place at the right time: when it's ant-free. The scouts move around pretty randomly at first. They might bump into a cockroach more than once without registering it. But accidents do happen, and woe be unto the cockroach whose foot is caught by some six-legged Fate in a first confrontation, for he shall limp thereafter and thus prove easier prey. Once a roach is disabled to the point of relative immobility by a series of such accidents, a mob scene rapidly develops – clinging clots of mesmerized myrmidons – and that's that. "*La cucaracha, la cucaracha, ya no puede caminar*," as any kid could tell you.

In a way, La Ronda provides us a service in exchange for the seemingly interminable hours of our inconvenience. But I

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*The sort of mail that brightens editors' days. Dunno anything about Meredith Foyle except address: Cartago, Valle, Colombia. Dunno even gender of author. I read once that articles and stories in the New* **Yorker** *were always at pains to make clear the sex of the author because the byline wasn't until the end and readers became upset when they got it wrong and didn't find out till too late. What do you think Meredith is? I say female.* *–SB* can't see how the capture and decimation of even so many as 100 cockroaches might justify some 10,000 ant-hours (or more), with the little buggers moving, moving, moving all the time, crossing and re-crossing every threshold of the house. Short rations, I say. Perhaps it's the joy of the chase or the anticipation of the kill. Or hormones, maybe? In any case, it's always a great relief to see them leave.

It is much worse when La Ronda comes to stay.

You wake up in the morning and somewhere in the house there's this huge ball of writhing bodies, built up layer upon layer like a golf ball, with the eggs and larvae at the center. They stick together by clasping forelegs, which are burr-like and cling easily. They can also form chains, globs, and bridges that way. There is a (possibly apocryphal) story about how balls of ants have rolled across rivers to get to the other side. Lenningen never had a chance. One morning, we awakened to find such a ball filling in the space under the sink with approximately four cubic feet of ants. We sprayed with Baygon (a household poison popular here) first. Some of the outer layers fell off, leaving most of the ball intact (but upset!) and a few strands hanging down like broken spiderwebs. Next we cut the ball away from the sink with a machete and tried to sweep it out with a broom. It rolled along nicely until hundreds of ants swarmed up the handle. Abandon stick! Pandemonium! Ants were everywhere, especially in the kitchen. Stomping a path to the stove, we liberated a pot of leftover soybeans and retreated to the hammocks for the day, making occasional forays to poison/sweep/stomp and retreat again till dark.

Next day, they had regrouped in a smaller cluster in the woodpile. Having declared genocide on the invaders, we sprayed, swept, and stomped for three days. We hunted out egg caches and squished, drowned, and poisoned them with kerosene and water. We were merciless fanatics. This is Integrated Pest Management? By the fourth day, ants were sufficiently few that one could wear house slippers indoors instead of boots, though the kitchen remained risky for stocking feet. Bombing halted; sporadic bursts of rapid-fire slipper-slapping took care of the rest. Rest in peace.

I still unearth a few crumpled-in-death bodies every time I sweep the kitchen or shuffle the kindling, and the walrus-like mandibles of a soldier lost in action catch on a sock from time to time, even now. I suppose such adventures are what makes life interesting here, but sometimes I find myself yearning for the simplicity of my Southern California childhood. There were only two kinds of ants then — the little black ones and the bigger red ones. The reds were the nasties, but they only lived outside the city limits and in Orange County. ■

## Culturgram

*"Culturgrams are briefings to aid understanding of, feeling for, and communication with other people." They succeed admirably.*

*Each Culturgram contains much of the sort of information usually left out of guidebooks: how to act when invited into someone's home, how to avoid being unintentionally obnoxious or frightening.*

*The price is right: $1 postpaid, for each four-page, 8½" x 11" pamphlet. There are currently 69 Culturgrams available. Other publications to encourage international communications are also available.* —*Walt Noiseux*

**Culturgram**
**$1** each postpaid
Any 10 Culturgrams
**$3.25** postpaid
Set of all 69
**$12.25** postpaid

Information
**free**
all from:
Brigham Young University
Language and Intercultural Research Center
240 B-34
Provo, UT 84602

•

**PORTUGAL**

**Greetings:** A warm, firm handshake is an appropriate greeting for anyone. First names are used for friends, youth, and children; otherwise, *Senhor* (Mr.) or *Senhora* (Mrs.) should be used before the family name.

**Visiting:** When visiting a family at home, a guest waits outside the door until he is invited inside. He sits when asked to and eats what is offered. It is polite to converse about a guest's family, positive aspects of Portugal, and personal interests. Guests should not be too inquisitive, nor should they be superficially friendly. Compliments are perfectly acceptable if they are sincere. When leaving, a guest usually allows his host to open the door for him.

•

**Social Classes:** Historically, classes have been very distinct, with a large, very poor lower class and a small, very powerful upper class. In recent times the middle class has been growing, especially in the cities, and the upper class has almost disappeared.

## Forsyth Travel Library

*An excellent mail order source for maps and guide books.*
—*Walt Noiseux*

**Forsyth Travel Library**
Catalog

**free** from:
Forsyth Travel Library
P.O. Box 2975
9154 West 57th Street
Shawnee Mission,
KS 66201

•

**Fodor's Canada 1980** — More Americans visit Canada than any other "foreign" country. Here is a fresh look at this exciting destination with the necessary travel information included. Many hotel, shopping, restaurant and tour tips, plus best value recommendations. Over 600 pages. Maps. (T)

•

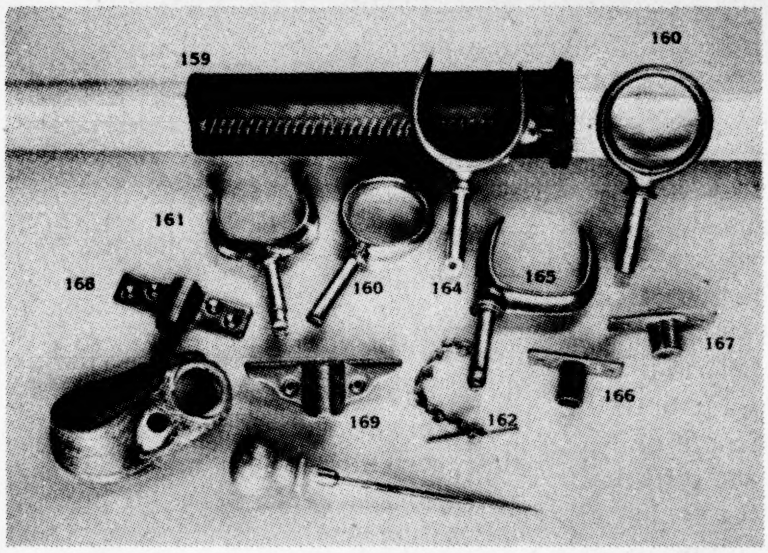
**Access to the World — A Travel Guide for the Handicapped** — by Louise Weiss. All forms of transportation are outlined. Major cities are evaluated with addresses for securing more specific information. International hotels which offer special facilities with advice on what to expect and avoid. Organizations and travel agents specializing in arrangements for the handicapped are listed. Index. 178 pages. (H)

## The Wooden Boat Shop

*Mouth-watering catalog of tools and materials for small wooden boat building from a very classy shop in Seattle, heart of the wooden boat revival.* —*SB*

**The Wooden Boat Shop**
Catalog

**$1.50** from:
The Wooden Boat Shop
1007 N.E. Boat Street
Seattle, WA 98105



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**Oarlocks and Sockets**

| | | | | | | |
|---|---|---|---|---|---|---|
| 159 | | 7.95 | each | 164 | 7.50 | each |
| 160 | #0 | 4.70 | each | 165 | 15.95 | pair |
| | #1 | 5.30 | each | 166 | 3.50 | each |
| 161 | | 5.45 | each | 167 | 3.75 | each |
| 162 | | 2.50 | pair | 168 | 4.20 | each |
| 163 | | 9.05 | each | 169 | 4.40 | each |

## Amateur Yacht Research Society

*AYRS is a lot more than snooty yachtsmen gathering together for a drinky-poo after the race. They are a group doing outlaw research into getting more power from the wind. The work is mostly aimed at raising the efficiency of boats, but they do windmill investigation too. What I like about this group and others like it is the attitude of adventure and excitement that shows in the hardware and the tests. The talk/do ratio is excellent. Makes you wonder what the huge budgets in big corporations are really used for. Anyway, AYRS publishes a selection of technical papers and books, which are half price to members. Subjects range widely; safety, sailing hydrofoils, kite-driven boats, rudder design. I wish they held their meetings closer to where I live.* —*J. Baldwin*

**Amateur Yacht Research Society**
Membership
**$20**

Publications list
**$1**
both from:
Amateur Yacht
Research Society
Hermitage, Newbury
Berkshire, RG16 9RQ
England

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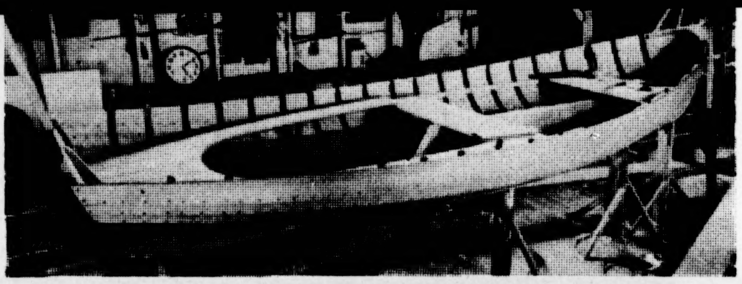
If there were a slogan chosen to typify the radical high speed sailing vehicle of today, it might well be: GET THE HULL OUT OF THE WATER! Because that is the direction in which designs are heading in order to achieve outstanding performance under sail.

**Cover photo from AYRS booklet Speed Sailing →**



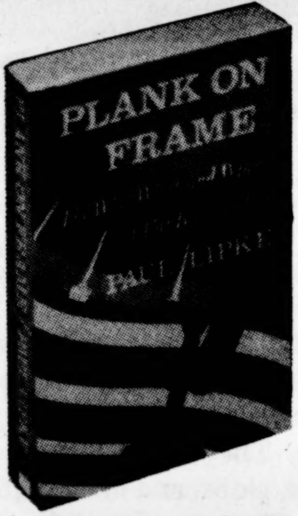
**A rowing/sailing skiff planked with Port Orford cedar nears completion in Ray Speck's shop.**

## Plank on Frame ↑

*The much-lamented dying art of wooden boatbuilding has apparently gone past death to vigorous rebirth. Here's amazingly researched description, commentary, and access on 150 first-rate boatbuilders based all over the U.S.A. One is probably near you, or near your dreams.* —*SB*

**Plank on Frame**
(The Who, What and Where of 150 Boatbuilders)
Paul Lipke
1981; 402 pp.

**$26.95** postpaid from:
International Marine Publishing Company
21 Elm Street
Camden, ME 04843
or Whole Earth Household Store



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**Ray Speck, 722 Waldo Point, Sausalito, CA 94965**
**(415) 332-6529**

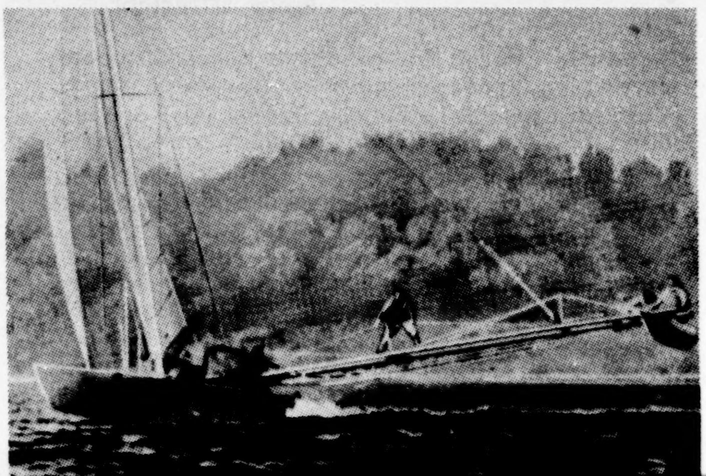
Ray is located smack in the middle of Waldo Point and its polyglot lifestyles. In this one small area, there are exotic Bohemian houseboats with bubble windows and hanging plants; the Bank of America with its manicured parking lot (the Establishment and all); and a third section with dozens of classic and not-so-classic cars, trucks, and boats in various stages of reconstruction and neglect. Amid the chic hipness of this ultimately Californian collage, Ray is a bedrock pragmatist with only a touch of romanticism about his vocation.

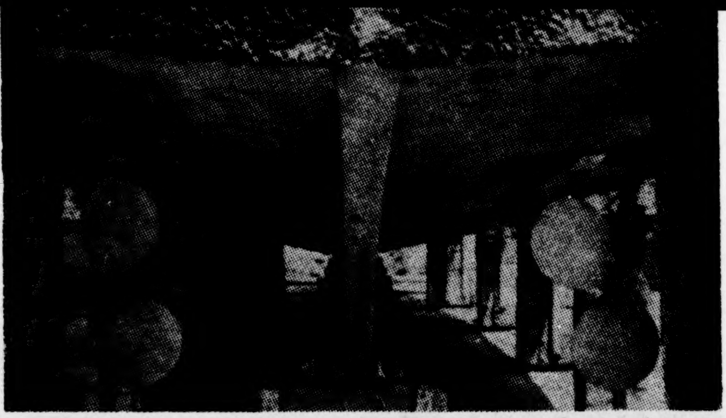
## WoodenBoat School

**WoodenBoat** *magazine, in its recent well-earned prosperity, is starting a boatbuilding school at its new headquarters near Brooklin, Maine. If you have basic woodworking skills, you can qualify for courses in Surveying, Repair and Restoration, Painting and Varnishing, Spar Making, Taking Off Lines and Elementary Drafting, Plywood Boatbuilding, Foundry Patternmaking and Casting, and Design and Construction of Cold-Molded Craft.* —*SB*

**WoodenBoat School**
Information and Applications

**free** from:
Kim Gellatly
Assistant Publisher
WoodenBoat Magazine
P.O. Box 78
Brooklin, ME 04616





**An illustration from National Fisherman showing a hull after 30 months in salt water. The area treated with Sharkskin is still clean, the rest foul.**

## Sharkskin ↑

*This miracle substance apparently can do three great things for the bottom of your boat simultaneously — increase the life of antifoulant paint, increase speed, and decrease fuel consumption. Described as an "antifoulant overcoat," the stuff is highly water-absorbent, making the boat/water interface much slipperier — 33% more speed or less fuel for motorboats (sailboat advantage in this is much less of course). Most antifoulant paints lose 80% of their virtue in the first four months. With this stuff the right amount of poison keeps oozing out for years — instead of hauling the boat out for painting every year, you can go two, three, or more years. (Hm, if everyone used Sharkskin, there would be two-thirds less toxicity in the water around marinas.)*

*Commercial fishermen, U.S. Navy, even oil tankers are using Sharkskin. I just put a coat on my 30-foot cutter. Victor Jorgensen's* **Telltale Compass** *(NWEC, p. 442) is where I first heard of it. Sharkskin runs about $120/gallon — cheaper than haulouts.* —SB

**Sharkskin Coating**
**$35** /quart (approx.)

Information and nearest dealer location
**free** from:
Preservation Technology
44 Hudson Street
New York, NY 10013

## The Underwater Naturalist

*Not for landlubbers. For real fishermen and divers. In-the-water naturalists only. A guppy-sized magazine with great coverage of natural history events along the coasts (especially the Atlantic). Everything from how to identify tuna species to short-changed sharks and head-starting turtles. An upwelling of true conservationist intimacy and love.* —*Peter Warshall*

**Underwater Naturalist**
(Bulletin of the American Littoral Society)
D.W. Bennett, Editor
**$15** /year (4 issues; includes membership)
from:
American Littoral Society
Highlands, NJ 07732

underwater naturalist

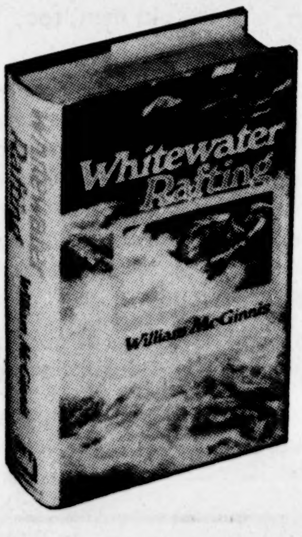
●

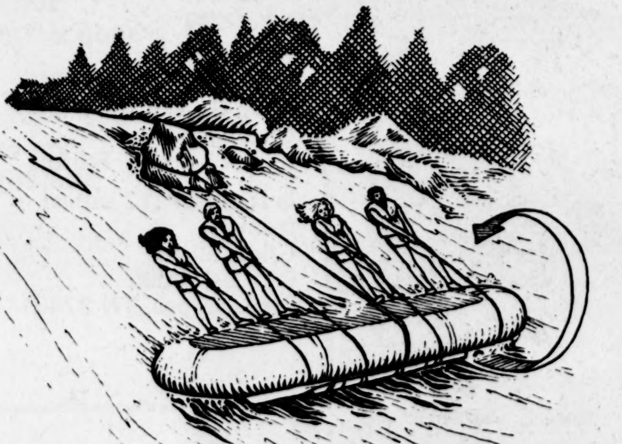
In order to answer the question why the flash, I decided to do direct observation. In the middle of a clear night, I went snorkeling with goggles. Instantly I was astounded by the too intense flash of a ctenophore that bumped against me. I was dizzied by the dinoflagellateme. It was like getting the third degree. I soon left the water, contenting myself by looking at the phenomena where the light was less brilliant, less intense. The experience made me consider that the role of luminescence was similar to the use of a bright light at night by deer hunters, to stun, to fixate their prey. Thus it seems logical that these organisms use their flash to stun their prey, to bedazzle their predators.

## Whitewater Rafting

*This is the veritable Bible of the sport, containing the most thorough discussions of everything from oar and paddle technique to food to first-aid to river saunas. All in a witty and occasionally farcical style, if not poetic at least infectious.* —*Roger Kaza*

**Whitewater Rafting**
William McGinniss
1975; 360 pp.
**$6.70** postpaid from:
The New York Times Book Company
Three Park Avenue
New York, NY 10016
or Whole Earth Household Store





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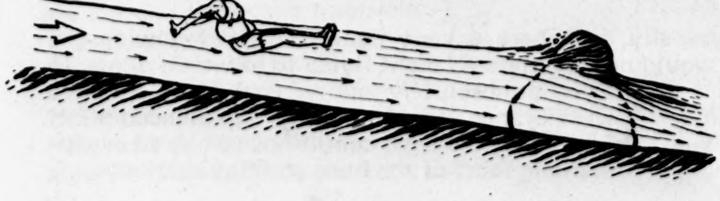
**Righting a flipped raft. A typical arrangement of righting ropes and anchoring line for righting a heavily laden raft. As the crew tilts the raft, the current gains a powerful grip on the raft's upstream edge and brings the raft upright. Because the crew winds up in the water, this operation should be performed in mild, not fast, current. The line anchoring the raft to the rock upstream and the shorter righting ropes, which have figure-eight grip knots at regular intervals, are tied to the downstream side of the frame.**



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**Swimming in a rapid. In rocky rapids, swim facing downstream with your feet out in front of you to ward off rocks. Your toes should just break the surface.**

## Glider Rider

*With the price of flight instruction from the Piper and Cessna types approaching $50/hour, it's easy to see why folks pick up on hang gliding. For $50 to $100, you can get a basic Hang 1 rating at a school, then buy a decent used machine for $600 to $900. After that it's just a matter of mounting tall objects and running off the edge, learning something new each time.*

*Here's a monthly journal out of Chattanooga with good coverage for the fans, from 100-mile record flights and new designs to gossip on the movers and shakers. There's a sizeable section on ultralights too, those powered hang gliders you see (and hear! They're getting as welcome in my area as unmuffled Harleys at a harpsichord concert) slogging through the air at 35 mph.* **Glider Rider** *is attempting to raise the group consciousness level with items on the realities of the sky, including that vague but omnipotent agency, the FAA. Hang gliders, ultralights, and the pilots thereof are completely unlicensed so far, but having seen a couple of ultralights chased out of the local airport recently for gross ignorances (landing without entering the pattern — then they took off down a taxiway!), it seems just a matter of time before they start paying dues.*

*Someday soon the sport will arrive; then there'll be regulations from here to tomorrow, and* **Glider Rider** *will be a slick publication with serious income and circulation, as well as salary for the staff. So read it now (and stash away a copy for historical purposes) while it's still a funky little pulp that's laying out the essence.*

*—Dick Fugett*
*[Suggested by Ron Stinnett]*

Glider Rider
Night Flight
Blue Stratos Tow Meet
Rib Stitching The Easy Riser

**Glider Rider**
(The Magazine of
Hang Gliding and
Ultralight Aviation)
Buzz Chalmers, Editor
**$15** /year (12 issues)
from:
Glider Rider
P.O. Box 6009
Chattanooga, TN 37401

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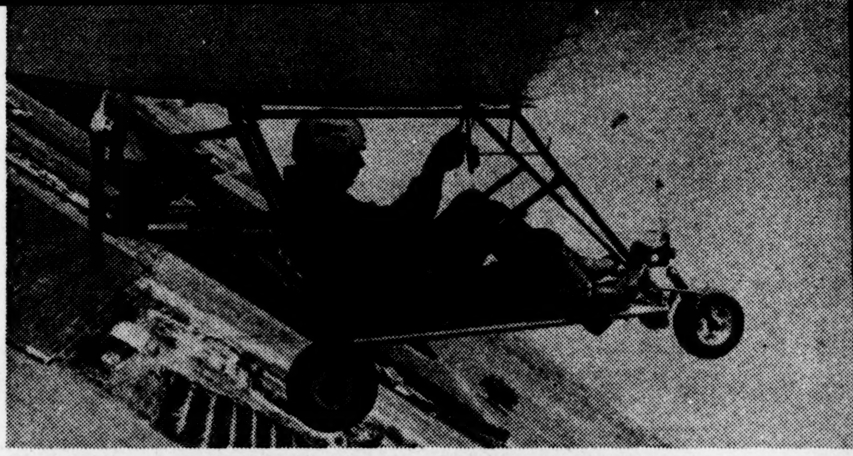
Within seconds of attaining airspeed, I banked to the right. The air was as stable as I have ever felt it, and the kite handled perfectly. My plan was to traverse the north side of the mountain and hopefully be silhouetted against the moon. To my surprise, as I coasted along I began to gain altitude. Apparently the mountain was still occasionally releasing heat absorbed during the day. The lift was so smooth that the only way I could tell I was higher was I could see over the mountain. . . .

I would not fly at night if there wasn't a full moon in a clear sky, or if there was any significant wind blowing. I would not recommend night flying to low-time pilots, to anyone who is not absolutely familiar with his kite, nor to anyone flying a strange site. But for the experienced pilot, flying at night under the right conditions can be an exceptionally rewarding facet of the hang gliding experience.



**Dick Clawson of Visalia, California took this photo of himself in steep climb in a Mitchell Wing.**

## 31 Practical Ultralight Aircraft You Can Build ↑

*Like most nifty things in this world, doing the human insect bit involves certain risks. These tiny aircraft bring a kind of eerie reality to the dream that so many of us share — that of being able to just fly around at will. And used with discretion they actually are reasonably safe. You can motor around for less than $3000 getting 100 miles per gallon. Some of these machines are among the most highly developed available, and taken as a group they point the way to a new era in people's aviation. If you're tempted, this book will be the last straw.*

*—J. Baldwin*

**31 Practical Ultralight Aircraft You Can Build**
Don Dwiggins
1980; 128 pp.

**$4.95** postpaid from:
TAB Books
P.O. Box 40
Blue Ridge Summit,
PA 17214
or Whole Earth
Household Store

31 PRACTICAL ULTRALIGHT AIRCRAFT YOU CAN BUILD

## Nice letter from a hero of ours

Dear Mr. Brand:

That was a most pleasant surprise, your running **Stick and Rudder** again in the **Whole Earth Catalog, (NWEC, p. 459)**. It will keep the old book perking a little while longer, and the old man, too. So this is just to say hello and thank you.

I was fascinated by many items, among them the instant turn prescription for bikes on page 410. This is exactly what Wilbur Wright maintained in court, in the brothers' long patent suit circa 1910. He said in effect that all turns on bikes were made that way, and I had never understood it. He tied it up somehow with the role of the rudder on his airplanes, some argument I still don't understand.

Good book, with lots of good stuff to inject into the American scene. Thank you again.

Sincerely yours,

Wolfgang Langewiesche
Princeton, New Jersey

## Going to See the Guru *by Mark Worden*

The troubled young man went to the Guru and asked for help in his life which was full of poverty, loneliness and misery. In the vernacular of the latter quarter of the 20th century U.S.A., the troubled young man was not "making it."

The Guru gazed impassively at the young man and almost imperceptibly nodded as the young man spoke. And then, when the troubled young man had finished, the Guru went into himself as Gurus do and came back and said "I can help you with many things in our joint pilgrimage through this stark and lonely life. We will share our tales, struggles, and in sharing grow to be more fully human, more aware of strengths and weaknesses, more able to seek the life experiences which nourish and do not stunt our growth and stultify our senses. Let us begin by filling out these forms."

The troubled young man looked down. He said, "I cannot write."

The Guru gazed at the troubled young man for a long time, then his eyes glanced heavenward. "Then this is the help I will give," the Guru said. "You do not need a Guru. You need a technician. I will make a referral." ■

*Mark Worden is director of an alcohol and drug program in Roseburg, Oregon. "I've seen gurus at work, seen folks going to see the guru, seen folks sent to see the guru."*
—*SB*

## 11 maxims *by George Miller*

**1. The mind is a mismatch detector. It is easier to see what is wrong than what is right.**

**2. People do not usually try to disprove their own ideas.**

**3. Stereotypes are easier than statistics. People believe in correlations that do not exist and overlook correlations that do.**

**4. In order to understand what another person is saying, you must assume that it is true and try to imagine what it could be true of.**

**5. Similarity is asymmetrical. The unusual is always more similar to the familiar than the familiar is to the unusual. Impart new information by relating it to old information.**

**6. Reality is vastly overrated. It is the point of origin from which the mind departs. There is nothing more practical than a good theory.**

**7. The span of attention is limited. People seldom find anything that they are not looking for. All research is done where the light is best.**

**8. Two little problems are easier to solve than one big problem. Carve big problems at their joints.**

**9. All things being equal, how much you learn depends on how much you study.**

**10. Human language is shaped by the minds of infants. Speaking is innate, writing is an invention.**

**11. Most people use logic to test a conclusion already reached by intuition. It helps them make their presuppositions explicit.**

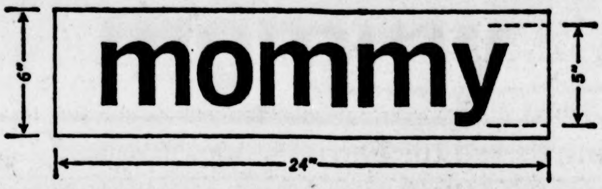
*Came across this* Psychology Today *interview with George Miller, a heavyweight in the American psychologists community, and thought that the 11 maxims might interest y'all.* —*Rob Roach*
*Olympia, Washington*

## Studying Buddhism in India

*The chance to do some serious meditation in Bodh Gaya, India, the site of Buddha's illumination, doesn't come along too often. Here's a program from Antioch University that includes not only formal study of Buddhist philosophy but also disciplined meditation practice under the direction of instructors representing the three principle traditions — Theravadan, Mahayana, and Vajrayana.*

*Students live in a local monastery and observe the Five Precepts (to refrain from destroying life, theft, sexual misconduct, false speech and intoxicants) during the three-month program, which costs $2850 from London and offers full academic credit for those still caught up in that particular desire syndrome. Those who aren't are eligible too. An excellent opportunity to meet both Buddhism and the Third World.*
*—Dick Fugett*
*[Suggested by Robert Pryor and Nancy Doyle]*

**Antioch International**
Information free from Antioch International, Antioch University, Yellow Springs, Ohio 45387.



## How to Teach Your Baby to Read

*I first heard about this book from my neighbor, the mother of a child with Down's Syndrome. Tireless in her efforts to give Jake the best possible life, she heard about and took him to Glenn Doman, the author of this book. My son Gerald was then three months old. She suggested that I start to teach him to read when he reached six months.*

*Three months later she brought me some 4" x 8" cards, handlettered in lower case with black marking pen, one word per card. Twice a day flash each card no more than ten seconds, no more than three minutes per sitting; say the word distinctly. If he doesn't appear interested, don't persist. Use any word you would normally use during the day (and's, but's, and the's count). That was the extent of my instruction.*

*I started. Gerald loved it. He ate more than a few cards, but it was a small price to pay for the day when I was standing next to a pile of 20 pound sacks of Friskies ocean fish flavor cat food, and he said "fish." Gerald isn't quite fifteen months old today.*

*The book itself is 16 years old so the instructions are for what they knew then. You can go much faster. (You don't need feedback, but it helps.) You also don't need to teach in units, i.e. parts of the body. The first two-thirds of the book is devoted to convincing you that you can teach your baby to read. The same author has another book,* **How to Teach Your Baby Math,** *which I haven't seen yet.* —*Lois Britton*

**How to Teach Your Baby to Read**
Glenn Doman
1964, 1975; 191 pp.

**$3.50** postpaid from:
Doubleday and Company
50 Franklin Avenue
Garden City, NY 11530
or Whole Earth
Household Store

HOW TO TEACH YOUR BABY TO READ
Glenn Doman

•

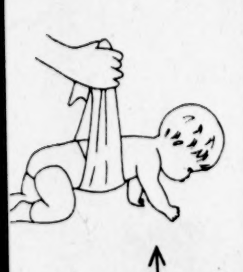
The parent should consistently remember two things:

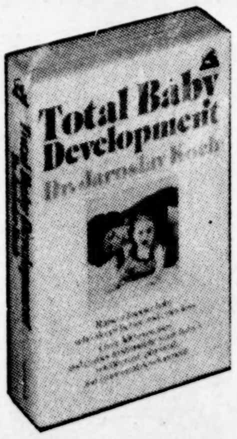
1. Learning is more fun than anything else.
2. Sessions should always end *before* the child wants to stop.

## Total Baby Development

*Dr. Jaroslav Koch is a Czechoslovakian doctor who has specialized in child care for over 50 years. He has developed a system of exercising and stimulating babies starting with the second or third week of life that not only helps in physical development, but leads to better appetites, sounder sleeping, and happier babies. In controlled experiments, 50 infants were given Koch's exercises, as opposed to 100 babies raised under normal family conditions. In development of physical movements, the exercised babies were three to four weeks ahead of the control group at six months of age; six to eight weeks ahead at one year. At eight months the exercised children held on to furniture and pulled themselves up; at ten months began to walk and at twelve months ran around in the park. Not only were there physical differences, but the exercised babies were more alert, had better dispositions, and at one year had a vocabulary of 20 words, compared to the control group's five.*

*This is more than a physical fitness book for babies. There are excercises for all the senses, for developing delicate hand movements, and for stimulating the baby's interest in life and adventure.* —*Lloyd Kahn*





**Total Baby Development**
Dr. Jaroslav Koch
1976; 351 pp.

**$10.95** postpaid from:
Simon and Schuster
Attn: Order Department
1230 Avenue of
the Americas
New York, NY 10020
or Whole Earth
Household Store

EXERCISE 124 (7 to 9 months)

Crawling in a sling. Fold a diaper to form a wide sling and wrap it around baby's chest with both ends over his back. Grasp both ends and with the aid of the sling lift baby's chest, about 4 to 6 inches above the ground. This makes it easier for him to draw his legs up to his tummy. Baby will kneel on all fours and begin to push off with his hands and feet and crawl toward a toy which you have placed in front of him.

## Instant Parent

*As the divorce rate escalates in this country, more and more individuals find themselves in the awkward position of "instant parent" to the children-by-previous-marriage of a new spouse. If such an individual has never lived with children, the experience can be shattering, and can break up a marriage without either partner quite comprehending what went wrong.* **Instant Parent** *is written from the experience of one who endured the experience and lived to tell about it.*

*This is a funny, wise, and astonishingly honest book, a sort of Erma Bombeck guide to part-time or full-time parenting of someone else's children. Drawing on her own appalling mistakes, all made with the best intentions, Suzy Kalter covers everything from practical details such as bathing a child, traveling with children, making cinnamon toast (the right way), washing a child's hair, children and restaurants, babysitters, etc., to such world-shaking upheavals as disillusionment, jealousy, rejection, guilt, and murder fantasies.*

*This would also be useful book for parents who adopt older children, and for anyone who has ever had to suppress the impulse to throttle someone else's children (or one's own).* —*Carol Van Strum*

**Instant Parent**
(A Guide for Stepparents,
Part-time Parents and
Grandparents)
Suzy Kalter
1979; 256 pp.

**$3.25** postpaid from:
Berkley Publishing Co.
390 Murray Hill Parkway
East Rutherford, NJ 07073
or Whole Earth
Household Store

INSTANT PARENT
SUZY KALTER

•

Answer their manipulative phrases this way:

1. Tough shit.
2. Tough shit.
3. Tough shit.
4. Tough shit.
5. Tough shit.
6. That's really nice, but tough shit.
7. Ha. I'll never fall for that one. Tough shit.

## Living With Children

*How many children irritate, exasperate, or just plain infuriate you with habitually obnoxious behavior? You've probably met some, or maybe all of the following: the kid who says no to everything; the one who whines incessantly; the aggressive, violent little monster who punches, kicks, bites and shoves his way through the world. Or the one who clings mercilessly to mama, screaming if she vanishes for three seconds, crawling all over her if she tries to talk to anyone else. The sloppy, rude, inconsiderate little creep who can trash an entire house in five minutes. The hyperactive, noisy one you can't turn off. The timid little wretch who is afraid of everyone but mama, or the one who can't tie his shoes or take even minimal care of himself by age ten. The one who throws temper tantrums at bedtime or in front of the candy counter at the supermarket.*

*Sound familiar? Sound like the friends' kids you hope they'll leave at home when they come to visit? Or — good grief — sound like your own little bundles of joy? Do you find yourself turning into a nag, a fishwife, a shrew, a W.C. Fields, harboring gleeful thoughts of infanticide?*

*Behold, there's hope! Out of the best and most loving intentions, parents unwittingly "train" their child (and he trains them) to act in undesirable ways. What has been trained can be untrained, and parents can undo even the most offensive habits and teach competing and desirable behaviors, in the process teaching themselves to be more effective and lovable parents.*

*This little book is without question the best and most effective volume on child-raising I have ever read. It is a 96-page programmed text in parenting, a godsend for parents of children with any of the above problems, and a welcome guide for parents-to-be, to help them avoid such problems from the beginning. —Carol Van Strum*

**Living With Children**
(New Methods for
Parents and Teachers)
Gerald R. Patterson
1968, 1976; 117 pp.
**$5.95** postpaid from:
Research Press
2612 North Mattis Ave.
Champaign, IL 61820
or Whole Earth
Household Store

Living With Children

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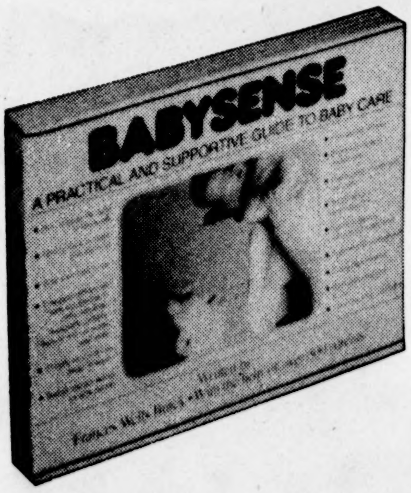
The basic idea is to teach the child that temper tantrums and whining will no longer "work." Arrange for a conference with your child. Both parents must be present. "You are a big girl (boy) now, and can do lots of things. One problem though is a worry to your mother and me. It seems a lot of times when we say 'No' you get pretty upset and do lots of yelling and whining. I think you can learn to stop doing that; we will help you practice. Each time you have a temper tantrum, we will say, 'OK, 2 minutes of Time Out.' Then you go into the bathroom. I will set this timer for 2 minutes. When it goes off, you come out. OK?"

Remember that Time Out (TO) means 2 minutes alone in the bathroom with the door closed. The child is put in Time Out at the start of each tantrum behavior. If she does not go into Time Out when she is supposed to, she is told that she must spend an extra minute in TO for not minding. The kitchen timer is set so the child can hear it ring when TO is over, and under no circumstances does anyone talk to the child during TO. . . .

If she has her temper tantrum at the store or somewhere else, then put her in Time Out when she gets home.

## Babysense

*An astonishingly comprehensive book on baby-having, the more so because it feels brief and easy to use. No book we've seen surrounds the subject as well — waiting, breast-feeding, bottle feeding, solid foods, crying, colic, sleep, bathing, clothes, transition to motherhood, child-care, equipment, economizing, health, toys. Lots of info, but surprisingly conversational. —SB*



**Babysense**
(A Practical and
Supportive Guide
to Baby Care)
Frances Wells Burck
1979; 282 pp.

**$5.95** postpaid from:
Simon and Schuster
Attn: Order Department
1230 Avenue of
the Americas
New York, NY 10020
or Whole Earth
Household Store

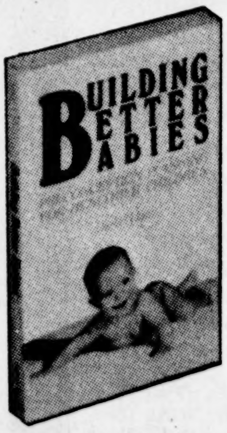
•

There is growing evidence that overfeeding in the first half-year actually increases the number of fat cells by programming an increase in the production of insulin and growth hormones. An adult who has been overweight since infancy or early infancy or early childhood can diet to reduce the size of individual fat cells, but never the number. The tendency to take on weight easily will always be there.

## Building Better Babies

*Dr. Elam offers well-documented nutritional remedies and preventive measures for the potentially appalling problems of sterility, birth defects, miscarriages, and unrealized genetic potential that threaten all humans today. His book is excellently referenced, with good diagrams and clear, often eloquent, text. A frightening and dreary subject has become in Dr. Elam's hands a message of hope. He gives the impression of being a well-informed scientist who likes to hold babies, and prefers them to be whole and hearty. —Carol Van Strum*

**Building Better Babies**
(Preconception Planning
for Healthier Children)
Daniel Elam
1980; 153 pp.
**$7.95** postpaid from:
Celestial Arts
231 Adrian Road
Millbrae, CA 94030
or Whole Earth
Household Store



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Clinical studies of human couples have demonstrated that the probability of a fertile union is highest when intercourse occurs during the *three days preceding ovulation.* This is also the time when the chances for miscarriage are lowest. It is the time period when a freshly ovulated ovum has the best chance of encountering a fresh, active sperm.

# EDUCATION AND SOLIPSISM

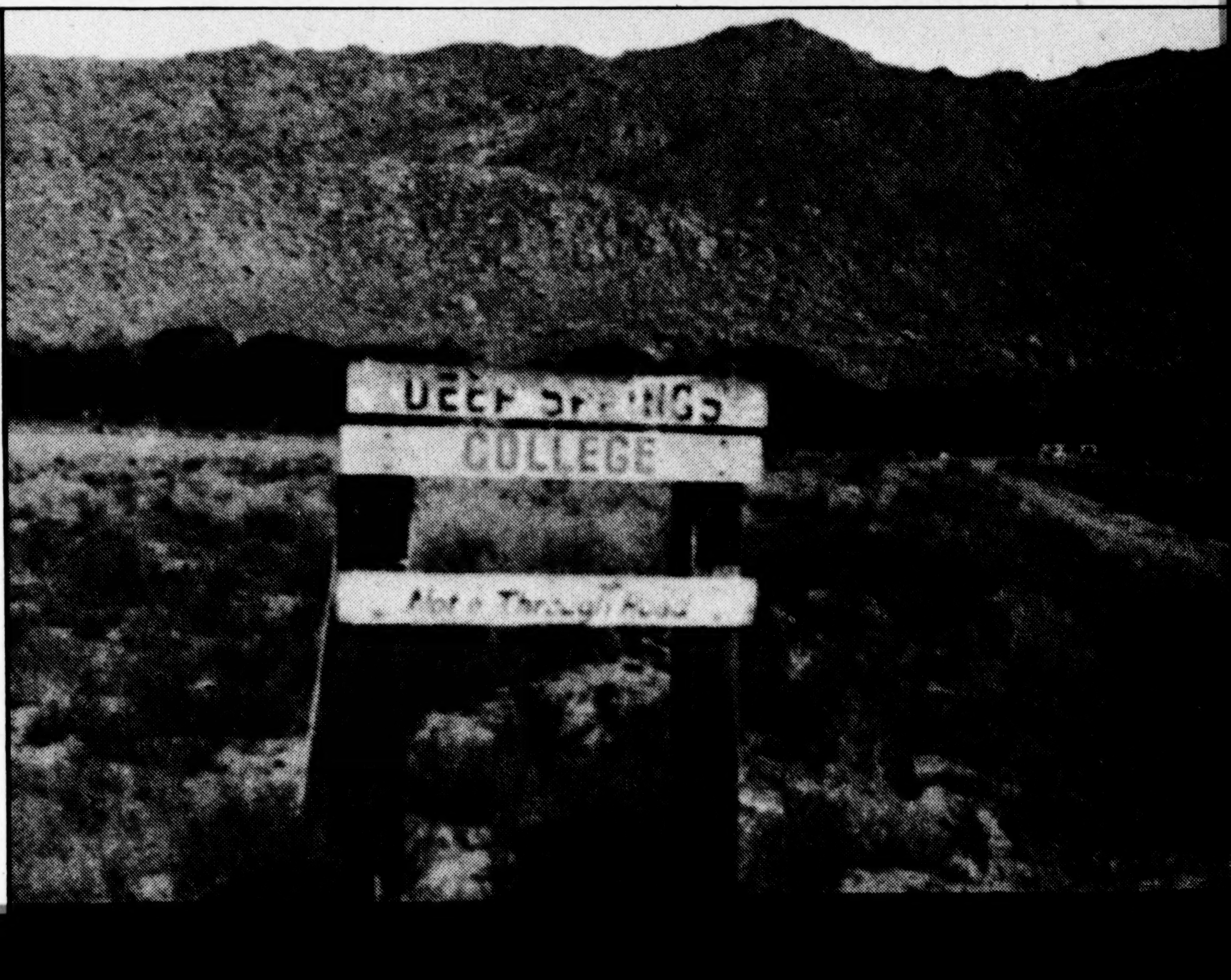
**sol•ip•sism** (sŏl′əp-sĭz′əm, sō′ləp-) *n.* The theory that the self is the only reality. [L *sōlus,* alone + *ipse,* self + -ISM.] **—sol′ip•sist** *n.* **—sol′ip•sis′tic** *adj.* *—American Heritage Dictionary*

*by David Schuman*

I RECENTLY HAD CAUSE to look through the catalog of a fully-accredited institution of higher learning called John F. Kennedy University of Orinda, California. The courses there fell into two categories: on the one hand, there was a graduate program in parapsychology, English offerings in "Literature of the Mystic Quest" and "The Energy of Communication," a two-year sequence called "The Tapestry of Knowledge," something on "Varieties of Mind-Body Therapies" – in other words, the sort of psycho-junk you expect to see advertised on the bulletin board at your local frozen yogurt parlor. On the other hand were courses of straight no-nonsense training in Police Science, Personnel Management, Business Administration, and Accounting. I couldn't help wondering how the Primal Scream majors got along with the pre-cops when they happened to meet up in the cafeteria.

I was about to dismiss the school as just so much institutionalized Bay Area weirdness when it occurred to me that John F. Kennedy University was on to something. Not only were the touchy-feely courses and the career training united by the dynamic of egoism and narcissism masquerading as "potential"; too, the university was responding in predictable and understandable fashion to real shortcomings in our conventional colleges. All over the nation, people are beginning to see that the increase in college enrollments has not led to a decrease in misery, small-mindedness, or social pathology; people are beginning to call for education that is integrative, value-oriented, and humane – at the same time that they demand practicality and cost-effectiveness. Universities respond to this conflicting message with such token reforms as refurbished core curricula and affinity-group housing, all the while coming more and more into

**Deep Springs Campus** →



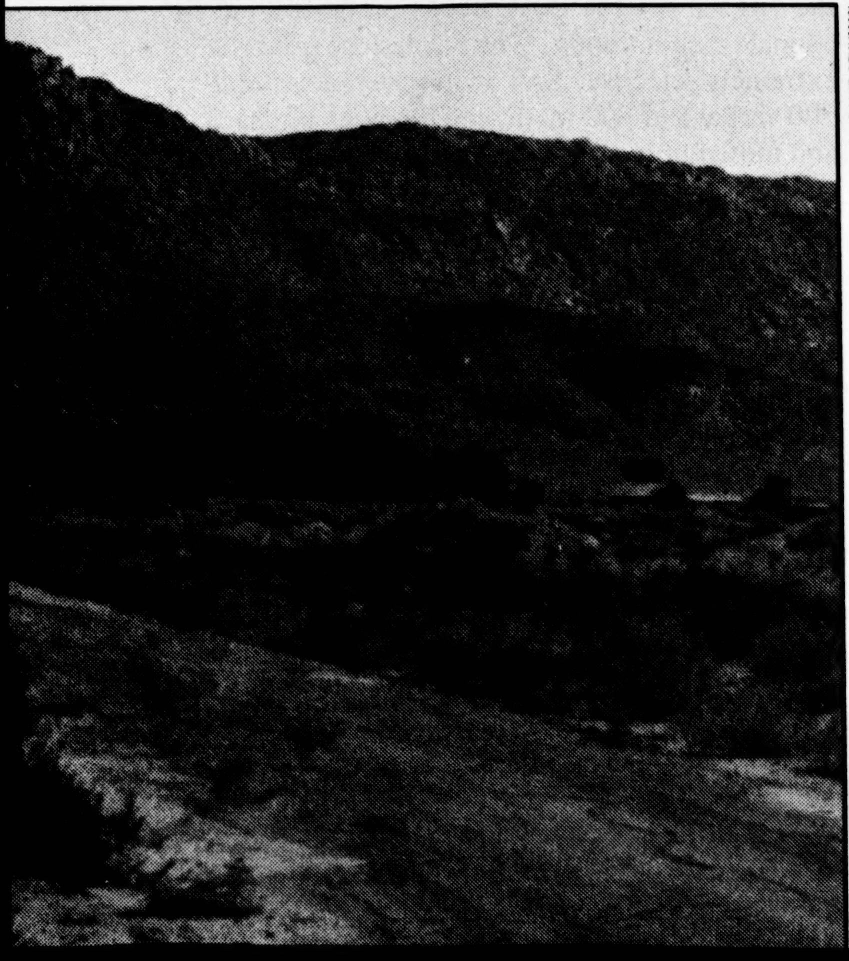
*The largest campus – an entire 50-square-mile high desert valley to itself – the smallest student body – 23 young men – and a 64 year achievement of serious education, Deep Springs College has a better, older way. If you want something to last, a car, a shoe, a college, drop it in the desert. (Address: Deep Springs, California, via Dyer, Nevada 98010.)*
*–SB*

***Why can't college education take place in an environment that not only allows, but demands moral, ethical, and emotional growth?***

the power of the marketing specialists, the Management By Objective seminarians, and the bottom-line boys. John F. Kennedy University is unique only in that it takes both routes at the same time.

There are better responses, and I will describe one in some detail. But first, it is necessary to recognize that in crucial ways our colleges are structured to produce not citizens and compassionate people, but self-serving egomaniacs.

The normal college performs several functions quite well: students with discipline and curiosity can emerge with impressive verbal and quantitative skills, a sufficient familiarity with the Western tradition of thought, and thorough knowledge of an academic field. In four years of more or less independent living they can establish goals and identities outside the influence of the home. I do not mean to belittle these accomplishments.



DAVID SCHUMAN

Yet it seems to me that all too frequently they take place in an environment that isolates and fragments the individual. During his first week in a normal college the student, no matter what courses he chooses, learns that the next few years consist of a series of obstacles – classes, distribution requirements, exams, theses – leading finally to graduation. The defining characteristic of these tasks, and what makes them almost unique in human endeavor, is that they are faced by the individual alone, and that success or failure in them has consequences to the individual alone. As a result, one of the undeniable and pervasive fictions colleges teach every day is that life's problems present themselves to individuals, are solved or not solved by individuals, with repercussions that do not extend beyond individuals. Thus, when we see people in later life deserting their families, exploiting their employees, cheating their bosses, befouling their environment, and otherwise indulging themselves, all the while blithely assuring everybody that while they might not be acting well, it's OK because they are "taking responsibility for their actions," these people are repeating the lesson they learned, among other places, in college, where they could flunk a test, cut a class, or skip an assignment without visibly affecting anybody but themselves. College is where we are confirmed in our delusion that the source and outer frontier of all significant action is the self.

And if this weren't bad enough, the concept of "self" that conventional colleges promote is preposterously distorted. I am not the first to point out that in spite of all the rhetoric to the contrary, our system of higher education produces cerebrating machines by intention, and emotional, ethical, and physical people only as an afterthought. At most universities, certain elements of the human character are identified over and over, in the classroom, as crucial to the survival of the race: sympathy and compassion, the ability to make responsible judgments, the ability to live together in harmony. Yet the situation in which these abilities are lauded is one where competition and caginess determine success, and important decisions are the exclusive reserve of the teacher. When it comes to actually cultivating the desirable human traits, or even to providing a milieu in which they might be nurtured, the academy either begs off entirely or else establishes an ill-financed and ineptly-staffed Office of Student Services — whose principal duties are likely to consist of cafeteria policy and Greek residence coordination.

Why can't college education – or at least part of it – take place in an environment that not only

Morning at Deep Springs: class

JACK MURPHY

allows, but that demands moral, ethical, and emotional growth? An environment where values must be discovered and tested as part of everyday life? An environment that combines freedom with serious obligation, exposing thoughtlessness and self-indulgence, providing students the rare and difficult opportunity to find out what it means to make decisions and to live with their consequences – in other words, what it means to try to live virtuously?

Nothing in my first fifteen years as a student and teacher in some of the finest universities in the country led me to believe that such an environment was even contemplated, much less accomplished. Then I discovered a little-known institution called Deep Springs College, and although I now work there, I think I am objective when I say that it proves higher education need not be solipsistic.

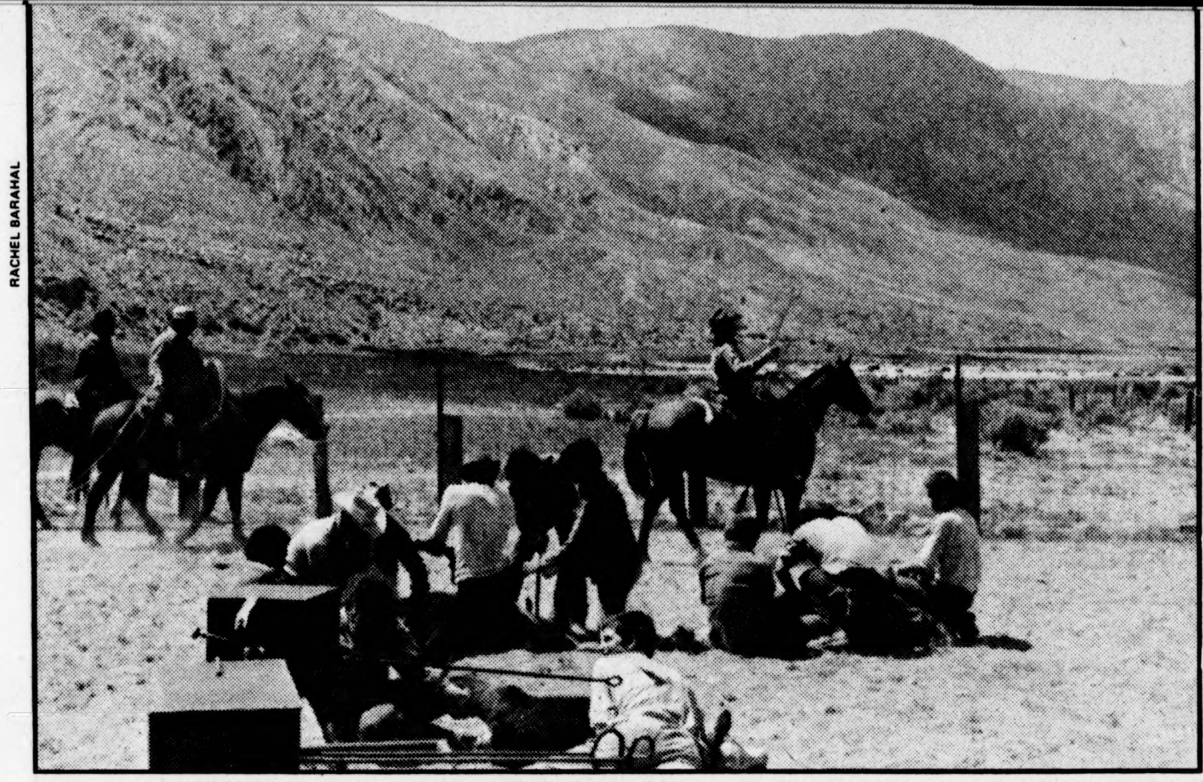
Deep Springs looks like one of those settlements in the high desert of Nevada that sits there a mile or so off a minor highway, nothing more than a few weathered ranch buildings, a scattered collection of semi-defunct rusted-out vehicles with their hoods perpetually raised, some cows, and a stand of cottonwoods. It appears to be just another of the small-scale beef-and-alfalfa operations scattered throughout the lunar expanse of sand, sagebrush, and abrupt rocky hills of the Great Basin, where the principal industry is nuclear waste disposal. No food, no gas, no lodging. Next service, eighty-five miles. In fact, Deep Springs is one of the nation's most unusual colleges, and has been since it was founded in 1917.

Radical even by modern standards, it must have seemed truly bizarre then. In deeding the land to the college, the founder, an industrialist named L.L. Nunn, specified that the enrollment should be held below twenty-six students, all of whom, in addition to their studies, would participate in a program of self-government, and work at least half time on the cattle ranch that is the college campus. The students were designated as the beneficial owners of the property, legally held by a board of trustees mandated to "ascertain, consider and comply with, the desires of" the student body. One of these trustees, according to the deed, was always to be an elected student. No fees whatsoever were to be charged.

None of this has changed since the founding. The student body is still responsible for the conduct of its own members. All students work twenty hours per week – not in payment for their education, but as an integral part of it. There is no core curriculum and no degrees are awarded. After two or three years at Deep Springs, students transfer to conventional colleges as juniors.

These innovative features are bound together by a strong thread of traditionalism – some would say conservatism. At present, because of a clause in the original deed of trust, Deep Springs still has an all-male student body. The admissions policy is extremely selective: SAT scores average around 700 verbal and 700 math, and qualities of character and motivation are equally high. Although the classes are small (averaging three or four students) and often student-initiated, they are, by common consent, rigorously academic in their form and content, with reading assignments, papers, exams, and grades. The teachers are almost all Ph.D.s from places like Harvard, the University of Chicago, Yale, Cornell, Berkeley, and MIT – the same colleges to which many of the students transfer. Students affirm and maintain two "ground rules": nobody may use non-medicinal drugs, and nobody may leave the fifty square mile valley in which the college is located. Over the years, the alumni have tended toward the professions, academia, and government. There are a few novelists, composers, and painters. One or two are journalists. There are two university presidents, a federal judge, an ambassador. There is also a blacksmith, a riverboat

RACHEL BARAHAL



**Afternoon: ranch work (branding in this case).**

pilot, and a member of the Weather Underground. There have been, since 1917, only about 450 alumni, and on the whole they have fulfilled the founder's hopes that they would become responsible, altruistic, and idealistic citizens – not the "hirelings of the avaricious" that "our educational institutions too often prepare." Almost to a man, they live modestly, serve prodigiously, and look back on Deep Springs as the pivotal experience of their lives.

That experience, in fact as well as theory, little resembles what we usually think of as college life. Most of the students are up well before dawn, putting on overalls and boots to trudge through the dark to the chores. Some go off to milk the cows, some to feed the stock, some to set the tables for breakfast. At 7:30, when the old railroad bell rings to announce the meal, faculty, staff, families, and students drift to the boarding house from their nearby dorms and homes. Breakfast consists of milk less than two hours old, served from steel pitchers; home-churned butter; eggs from the hen house; and perhaps sausage from a pig that was raised and slaughtered by the students.

The morning is taken up with classes – normal undergraduate courses like Freshman English, French 2, Calculus, Introduction to Philosophy, and Shakespeare. The pace is rapid, and the discussions are animated. Frequently, when class is over, the discussion will spill out onto the lawn or into the boarding house, where it may continue for hours.

Classes end at lunchtime. The afternoon is devoted to ranch work. Students raise hay and cattle for sale, and have a dairy herd, bees, pigs, and a garden for domestic use. They also work in the office, library, bookstore, and dining hall. In essence, they staff the entire operation, with limited professional help. Faculty spend the afternoons preparing classes. On the rare occasions when they have a spare hour or two they are free to join in the labor. The work ends with dinner, and once again the whole community gathers to eat. During the meal someone taps a pitcher and begins the announcements: the student admissions committee will meet at eight to continue its review of applicants for next year's class; madrigal group at seven-thirty; volleyball between dinner and meetings; volunteers are needed to clean the chicken coop.

These activities wind down by nine or nine-thirty, and serious study begins (it is also carried on during the morning between classes, and at all odd hours). For a break, a student might wander to the boarding house, where the coffee urn is always on, there to find other students, perhaps a teacher or two, and endless talk. Lights burn late. The library never closes. As the last student is going to bed, perhaps having put the finishing touches on a term paper, the first is getting up for morning milking.

How does a life like this – anachronistic and contrived as it is – provide an education for the real world? If one starts from the premise that the world needs people who are not only schooled in the usual academic sense but also responsible and compassionate, then three features of the Deep Springs program emerge as essential – features that could easily be reproduced elsewhere: the intensity that derives from smallness and isolation; the distribution of powers; and the integrated programs of study, labor, and self-government.

The conventional college is structured around the motif of escape. Students escape the "real world" of work and accountability on campus. They escape the campus by going into town for entertainment. Socially, jocks escape nerds, fraternity men escape intellectuals, blacks escape whites, Young Americans for Freedom escape Students for a Democratic Society, faculty escape students. Everybody escapes thinking about curricular

**French class, main building**

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matters through chemical stupefaction and through the greatest escape of all: sleep. I think it is significant that the drugs of choice on college campuses have always been soporific (alcohol) or isolationist (marijuana), and the activity of choice has always been some form of escapism, frequently epitomized either by leaving or passing out.

With its population of about forty-five, Deep Springs is the only settlement in its valley. The nearest town is an hour away, on the other side of a magnificent but torturous 7000 foot mountain pass. As a result, the community is socially self-contained. While mail comes in daily and five or six times a semester there are visitors (family, guest speakers, applicants), the system remains emotionally sealed.

From this simple fact flow enormous consequences. People, who on the normal campus would dismiss each other immediately, often become as close as brothers at Deep Springs. They eat, study, work, and govern together. Late at night, any two of them are likely to find themselves the only people within a twenty-five mile radius who are awake. They will decide to have some coffee together and might end up sitting in the deserted boarding house until dawn. When this happens, and it happens frequently, superficial qualities retreat into insignificance, and human ones emerge. While real difficulties between people may remain, the judgments that are formed tend to be generous. Disliking someone at Deep Springs comes to be seen as a luxury and, like most luxuries, a waste.

Thus, easy judgments are discouraged. So too is that easiest of all judgments: the refusal to judge. Every year, two or three students arrive professing that whatever an individual does is his business, so long as nobody else is harmed, and that to judge him is a mistake if not a downright sin. I sometimes think that one of the only lessons high schools teach is that a "value judgment" is a morally reprehensible act tantamount to child molestation. In any case, in small communities, two facts quickly become evident: one is that those actions which are "harmless to others" are rare indeed. If a student sleeps through morning dairy, and the cows don't get milked, they get mastitis and when that happens nobody has milk. When there are only three students in a class and one of them is unprepared, the discussion suffers in ways that are immediately obvious. In a place like Deep Springs the consequences of all actions are conspicuous. A second lesson is that judgments get made, one way or another. A sick cow, an empty milk pitcher, a turgid class, are objectively and unambiguously bad. In such cases, committing a value judgment is a creative and constructive act. It places blame where it belongs, thus liberating the innocent, and it helps prevent future errors, thus aiding in the education of the guilty. It sets boundaries on the retribution, and it affirms that the community has identifiable values. If the judgment is executed in the spirit of generosity – and it usually is, not only because its maker and its receiver will probably have to face each other over breakfast the next morning, but also, given the circumstances, because the roles may soon be reversed – then the most valuable lesson of all occurs: the student finds that failure is not fatal, but human. Only at that point can he profit from it.

And who, exactly, does the final judging? To whom are students, teachers, and staff finally accountable? In other words, where does the real power lie?

Many colleges deal with this question in ways that no political theorist has seriously entertained since Aristotle distinguished the household from the state in Book I of the **Politics**. In the last couple of decades the concept of *in loco parentis* has disappeared only in the sense that it was synonymous with paternalism. The university still

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College student

operates like a family. Now, it is merely a "progressive" family instead of a despotic one. It is no longer accurate to say that all of the power is concentrated in a few fatherly administrators. But it remains a fact that when a question of rights, privileges, or jurisdiction arises, the contending factions square off like a couple of twelve-year-olds at recess. The atmosphere is permissive, but it is important to remember that "permissive" is a term from the lexicon of child psychology, not education or politics.

When colleges are overtly political, and use political terms, it is a politics of conflicting interest groups and of inherent inequality that is invoked. Nowhere do members of what we cynically call the university community talk or act as though there were, in fact, a community in the university. The ideas of mutual restraint, obligation, participation, agreement on major goals and basic philosophy that mark the discourse of true communities appear, at the conventional college, only in the textbooks of political theory classes. It is no coincidence, of course, that these classes themselves are more and more forced into extinction, to be replaced by ones that use the "clean" and "value free" terminology of social science, survey research, and bureaucracy: the language that is itself appropriate to the political structure of the liberal multiversity. That this is the structure of the political world, writ small, does not justify the situation. If colleges are the DNA of society, then we don't have far to look to discover how we might restore to the world that sense of community it needs.

One way might be to introduce young people to authority structures which are neither authoritarian nor flaccid, but political – in the Greek sense, where politics meant constant public participation in the ongoing effort to arrive at a good and just civic life. Smallness is a necessary quality for such a structure (Aristotle limited the size of the polis to those who could gather within hearing of a single orator), but it is not sufficient. A reasonably egalitarian and flexible distribution of power is also necessary.

For example, at Deep Springs, the board of trustees has *de jure* authority to act for the college. The chairman's signature appears on contracts and I.R.S. forms. But the board is obligated by the founding document, the deed of trust, to respect and comply with student sentiment and to that end a student is a full voting member. Also, the adult trustees live far from the college and convene there only twice a year, and thus could not interfere in the day-to-day operations if they wanted to – which they don't. In their absence, the chief administrator is the Director, but his powers are nowhere spelled out. The deed of trust specifically gives the student body responsibility for "the conduct of its own members," but what does that mean? Academic evaluation, power to sell the cattle, admissions and expulsions? Or quiet hours, dress codes, and films committee? Lurking in the background to confuse the issue even further is the alumni association, a powerful force in matters of institutional policy, and the faculty, traditionally pre-eminent in curriculum and academic affairs.

As a result of this nebulous power structure, nobody can arbitrarily pronounce on a public matter, and then justify himself by invoking some etched-in-marble constitution. This fact affects both the content of the decisions made, and the method of reaching them. Suddenly, considerations like mutual benefit, fairness, ethical content, even tradition, enter the picture where formerly chapter and verse would have sufficed. When the students vote to exercise their rights by adopting a stray dog, and then that dog bites a faculty member's infant daughter, they have learned an important distinction between power and justice. A

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College student

teacher who offers a class that nobody is interested in, merely because teachers have that right, and then finds himself with an empty classroom, has learned the same distinction. Very quickly, everybody learns that the only effective way to act is after exhaustive public debate, with all parties having the opportunity to formulate and present their point of view.

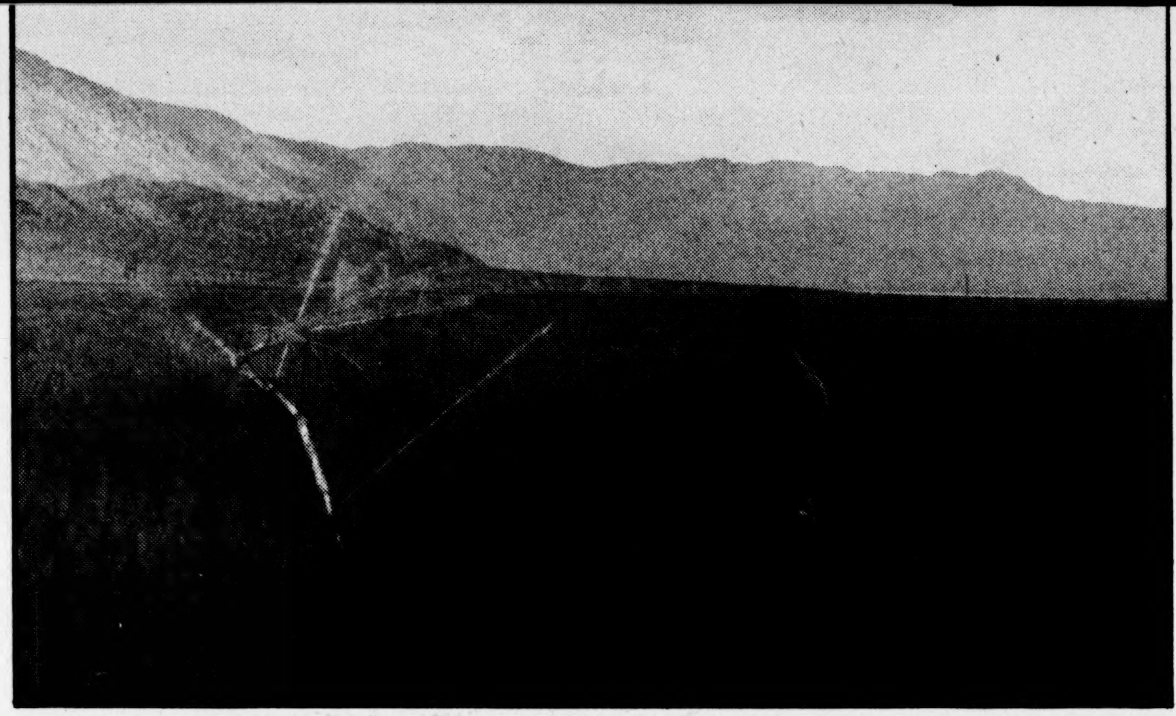
I do not mean either to describe or advocate a system where nobody is in charge. In fact, real authority exists, but not merely by virtue of status or prerogative; it stems from reason, and devolves on an individual or group that (to paraphrase Hannah Arendt) can show itself to be right, or that has been right so often in the past that its advice cannot be safely ignored.

This notion frequently turns up in an interdisciplinary seminar called "Problems in Community and Authority." The course demonstrates the most unusual and valuable of Deep Springs' features: the interdependence of the academics, the labor, and the self-government. Being bright and thoughtful young people, the students come into the seminar (usually offered as part of the orientation semester) with some well-entrenched theories. There are for example the high school Emersonians, repulsed by years of petty regulations, uninspiring teachers and lowest-common-denominator curriculum. They come to college hoping to find Transcendental Heaven, where the individuals' unfettered expressions of freedom magically coalesce into utopia. They enter the seminar believing that the government which governs least is best; that the ideal human condition is absolute liberty.

Then there are the high school Nietzscheans. Unchallenged, frustrated by a system that has failed to provide them structures for the development of their potential, disgusted with current trends of permissiveness and lack of standards, resentful of their high school's leveling tendency, they come to college hoping to find an environment that will provide them with discipline, channel their energy, and surround them with equals. They enter the seminar thinking that human progress will occur only in a context of control and dedication.

As the course moves from Plato and Aristotle through Thoreau and Mill, picking up Marx, Locke, Shakespeare, Orwell, Tocqueville, Melville, and others along the way, the students are alternately challenged and reinforced in their beliefs. Meanwhile, the Emersonian will notice that his liberty to drink fresh milk depends on his roommate's lack of liberty to sleep past 4:30; a Nietzschean may be elected to the position of labor commissioner, and discover that order and discipline involve telling a friend he has to spend all day Sunday castrating calves; in fact order and discipline may involve spending Sunday that way himself. In any case, he frequently finds himself being arbitrary and insensitive.

By the end of the course, everybody's ideas about liberty and society are sophisticated indeed; the students still have theories, no doubt, but they are true to experience, as that experience has been sensitized and refined by the best that has been thought and written on the subject. Locke believes that one acquires a right to property by mixing one's labor with it. A student mixes his labor with the alfalfa field all afternoon – poisoning gophers. Does he therefore own it? Marx says that alienation in labor is the result of the workers' relationship to the means of production. A student gets up early in the morning to slaughter a steer. He uses his own knife, he is the beneficial owner of the animal, and it will end up on his plate with nobody deriving a profit from it along the way. Yet, when he slips the knife into the animal's throat and gropes for the jugular, does he feel at one with himself and his work? A student believes that the past is nothing but an encumbrance that each individual must cast off in order to create his own relevant world, unfettered by tradition and outmoded ideology. Fine. But when the toilet in the guest cottage springs a leak, he discovers that scrapping the old system to put in a new one is simply not possible, because the plumbing is an extensive and delicate network; it's tied into the boiler, which has an electric thermostat run by the generator, and if the generator fails the irrigation lines stop sprinkling, and the alfalfa dies. and . . . So he learns to work within the context of what he has inherited. He discovers that many of the modern parts he can use are shabby when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Setting the irrigation wheel line

compared to the old ones he is replacing. And he learns that the generations of student maintenance men who over the decades have compiled a plumbing system manual – by now grease-stained and dog-eared – these dead hands of the past are not his stale oppressors, but the very agents of his liberation. A student condemns Goneril and Regan when they mistreat old Lear. Age has its prerogatives; "reason not the need." But where is this magnanimity when the cooks, a retired couple from Nevada, insist that the students wear shirts and shoes in the boarding house? Over and over, daily, the Deep Springs student must test his theory against the world that he inhabits and that his theories help to shape. He soon discovers that while any fool can have an ideal, it takes character to live up to one. He learns that to be of value, an ideal must bear some relation to behavior, without losing its defining essence of impossibility.

In the normal college, idealism too often serves as the handmaiden of despair. Lofty goals like the cure for cancer, the end of racism and poverty, the Great American Novel, all prove not only elusive, but totally out of range. All too frequently, the next step is a retreat into cynicism, hedonism, careerism, or narcissism. In a community where the student confronts as part of his daily life imperatives that cannot be abandoned, such a retreat is impossible. The leaking toilet must be fixed, the hay must be put up before first snow, the composition must be written, even when these tasks are "impossible." The student who sits in philosophy class expounding the theory of the Übermensch, then spends two hours trying to overcome a mule's desire to remain unharnessed, has learned an undeniable lesson about aspiring to toward the Godhead: he must do it, of course, but he must bring to the task some qualities of humility, commitment, dedication, and resilience.

I do not mean to propose Deep Springs as a utopia, or as a solution to the problems of education and society. The college's refusal to admit women is a serious shortcoming. Given the world of the 1980s, an all-male college that claims to value ethical development and to produce leaders is not just an anachronism, but an affront. Too, the school pays its faculty and staff poorly, and its elitism offends our democratic impulses.

But these problems are peculiar to this one institution; they are not of its essence, and similar schools could be structured so as to avoid them. Other problems, however, are inherent in just those qualities that make the school successful, and anyone who contemplates such a venture should be willing to accept them. At a certain point, intensity becomes frustration, accountability and openness becomes exhibitionism, and community becomes a pain in the neck. The small and isolated setting soon begins to give events a bizarre warp. Tiny irritations assume huge proportions: everything is a crisis, from a broken ditto machine to a fallen cake. Petty personal disputes can escalate quickly into feuds. Xenophobia and philosophical inbreeding are constant dangers.

On a more profound level, failure can become tragic. The stakes are high. At a normal college, failure is defined as a late paper, a dull class, a slanderous editorial in the school paper. At Deep Springs, failure is cruelty, insensitivity, arrogance, or irresponsibility. It involves real pain and suffering. It is unusual to live in such a place for any length of time without coming to believe that life presents one trial after another.

Yet it is equally unusual to emerge without coming to the belief that with discipline, patience, and cooperation, humans are capable of prevailing, and that the struggle is itself an education. Two years in a small, intense, isolated, self-governing community – no matter how rigorous the academic offerings – is not enough education for anybody. But it is enough so that when the student moves on to the more conventional academy, he does so with a new vision of himself and the world. What he sees is not just self, status and salary, mortgages and Mercedes, but a set of living obligations and possibilities. ■

# Mamas, Don't Let Your Babies Grow Up to be Chemists

## Let them be lawyers, accountants, and such

by Howard Adams

IN OUR AGE OF SPECIALIZATION it becomes more difficult to understand what it is people do in different vocations, particularly those in many areas of science. I've enjoyed learning from **CQ** about the lives of various types of scientists. Some of them seem to have achieved some sort of independence. I'd like to share some of the experiences of a dependent-type scientist. When I say dependent I don't mean just on a regular salary, although that's certainly part of it. I am dependent on a big facility for a proper laboratory and instrumentation.

I estimate there are about 100,000 of us chemists working unseen and unheard* in a large variety of research projects in industry. Not only is it a low profile career in the public eye, but it tends not to be too high in the family eye either. Curiously, many chemists have non-scientific background parents, and most marry spouses of decided liberal arts leanings. Consequently, when asked the question, "What happened at work?" the reply of "I finally synthesized that 2, 4-dihydroxy 3, 5-ditertiary butyl chalcone" is met with either a glazed look or a rather insincere "far out."

Another example is my personalized license plate which has the chemical formula K B305 on it. (That is the formula of a potassium borate salt which shows great promise as a lubricant — my current obsession.) What better way to popularize science? But all I've received are puzzled looks — not a single horn beep with wave or raised fist.

My first industrial research project may give you an idea of how my work goes. The assignment was to develop additives that would extend the life of plastics. The goal was for example to prevent you from crashing through your lawn chair webbing for 3 or 4 years instead of just one. In the sixties, novel plastics were developed that had marvelous properties which made possible the manufacture of many new articles at low cost. Remember that great line in **The Graduate** as the cuckolded husband was giving Dustin Hoffman the advice . . . "plastics." Polypropylene was one with lots of potential but had the problem of degrading rapidly when exposed to sunlight ultraviolet radiation. You make plastic articles by blending the stabilizer chemicals with pigments and fillers in the molten plastic, mixing well, then cooling under various process conditions to the shape you want. What was needed were more effective UV stabilizers.

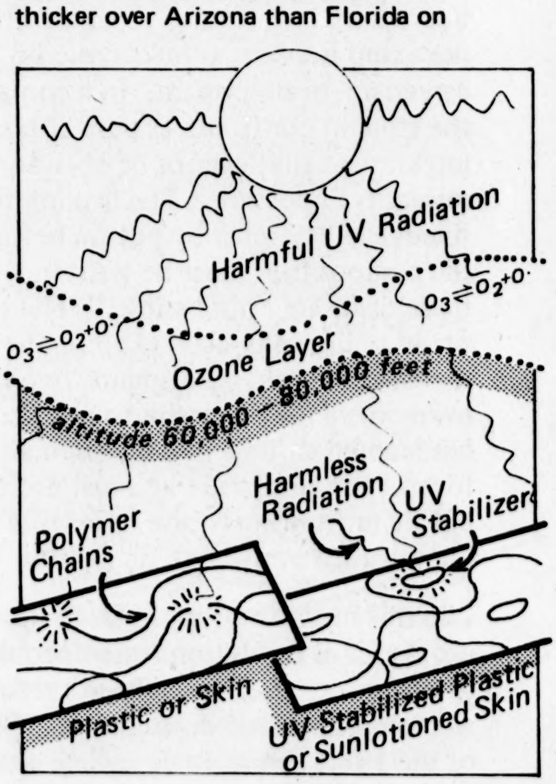
One thought that occurred to me is that wood is more or less a polymeric hydrocarbon like that of plastics. How come trees didn't degrade for thousands of years in some instances, whereas some plastics only lasted a few months in sunlight? I figured it must be some natural inhibitor in the bark. A prime suspect, or so I thought, was a class of compounds called flavanoids commonly found in bark.[1] Their aromatic structure was sure to absorb UV rays readily. So I synthesized some.[2] Sure enough, they absorbed UV radiation. However, perversity of nature being what it is, the compounds did not dissipate the absorbed UV energy harmlessly but actually seemed to transfer it to the polypropylene and caused a faster degradation than if they were not there at all. The compounds were not stabilizers but degradation promoters — which later became hot items as plastic stuff stacked up in city dumps. That didn't occur to us at the time, however.

**EARLY LESSON #1: Always patent an unexpected effect even though it's just the opposite of what you're looking for.**

Part of a research project besides making new, hopefully useful compounds is what we call mechanism studies. We tried to understand the process and we did so partially by analyzing the chemical composition of degraded polypropylene.[3]

Another puzzle for us was why certain sample exposure stations seemed more severe. We would send samples to be placed on sun exposure racks in Arizona and Florida. Arizona is much hotter, yet the Florida sample would fail faster for a given amount of sunshine. Nobody seemed to know why. Higher humidity was invoked.[4] That may be a viable explanation for nylon but not for the pure hydrocarbon types — polyethylene and polypropylene.

The answer to this puzzle came as a flash insight, the kind that scientists live for. Archimedes got one of his sitting in a bathtub. I got one of mine sitting in a conference in Palo Alto listening to a paper on variation of the ozone layer with seasons and latitudes. Latitude! That was the difference between the exposure stations. The Arizona station is at 33°N. The Florida station is at 26°N. The ozone layer is about 10% thicker over Arizona than Florida on


Harmful UV Radiation
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$O_3 \rightleftharpoons O_2 + O$
Ozone Layer
altitude 60,000 – 80,000 feet
Harmless Radiation
UV Stabilizer
Polymer Chains
Plastic or Skin
UV Stabilized Plastic or Sunlotioned Skin

DON RYAN

---

*Chemists by nature are generally a quiet lot.

an annual average. This cut down UV radiation by a considerable amount because ozone absorbs UV. I say considerable because a law by the name of Beer-Lambert says that a given reduction in the absorbing layer will allow an exponentially greater amount of radiation through.

You may have experienced this effect yourself. Some UV radiation wavelengths (2900-3150 Angstroms) that harm plastics also harm skin. Have you ever spent all day at the beach, say in Northern California in the spring, and then gone to Mexico on a trip and done the same thing there? No burn in California — bad burn in Mexico — same time of year. Latitude effect.

With this concept plus some other factors, I could now calculate an equation that could predict the lifetime of a plastic sensitive to UV radiation anywhere in the world. Important information I thought. Too important, I found out, to be allowed to be published. We could now guarantee our plastic products and know how long they would last. Our competition couldn't. (We had since found compounds other than flavanoids that did an effective job of UV stabilization.)

**EARLY LESSON #2: Important scientific information should be published as long as it isn't too important.**

So I got to know the ozone layer pretty well. Such things as the fact that the layer is confined to a surprisingly narrow altitude band. This was in 1969. Later that year while casually reading a newspaper article on the Super Sonic Transport, I became aware that coincidentally the SST was going to cruise at an altitude exactly that of the ozone layer. Interesting but probably not of concern.

I then ran across a paper by two department heads at the National Center for Atmospheric Research.[5] They presented a review of reactions of gases in the atmosphere. I realized that it was likely that small amounts of materials such as those emitted from a jet engine could react with ozone. I called one of the authors, Dr. Cadle. He hadn't realized that the SST would be flying at the ozone layer neighborhood. He said he wasn't sure who to contact with that information but would look into it. I told him I'd try to alert Boeing.

It's always an experience calling a big corporation without a particular name identified to contact. After a half hour or so and several dead ends I wound up talking to the chief design engineer for the SST. Much to my relief he was aware of the ozone layer. Much to my dismay he said they were doing no research on it. I explained as best I could my concerns and promised to send a copy of my internal report which described the sensitivity of UV radiation to any variation in ozone concentration. He said he'd appreciate any information like that.

Then came a frustrating four months of trying to clear the report through management and legal departments. After it cleared and I didn't receive any acknowledgement, I called several times to see if he received my report. He was always "in a meeting." I told his secretary that I was coming to Seattle on vacation and would like to stop in for a discussion if there was any clarification needed on some points in the paper. On a follow up call she relayed that that would be fine. After arriving in Seattle and making repeated calls, I got the same response — "always busy."

**EARLY LESSON #3: I'm not sure what it is, but it's there somewhere.**

About this time much to my relief an editorial appeared in a June 1970 issue of **Science** that listed a few groups doing research in the area of SST exhaust. I was not alone after all. I called some of them. They mostly seemed to be concerned with effect of additional water vapor causing some depletion of ozone. In the fall of 1970 the first Senate vote loomed on whether to continue federal financing of the SST development. I wrote Senators Cranston and Murphy describing my concern for potential danger to the environment.

Senator Cranston replied that he supported my view and would vote against. That was a needed tonic. Somebody finally listened.

Senator Murphy sent back a form letter on why he was opposed to gun control. Good ol' George.

Support for the SST was voted down 52-41. But it wasn't over by a long shot. I then became aware of how an effective lobby can operate. Boeing managed to get the Senate to vote on it two more times in the next six months. The next vote came in March 1971 was closer, 51-46. It would have been 50-47 but by then Murphy was gone and Tunney was in.

I had written Tunney shortly before the second vote and he sent back copies of speeches[6] which were marvels in doublespeak. He essentially said that he was opposed to the SST because it would be wrong for the aerospace industry. OK, John — whatever. I'd take support anyway I could.

Just two days before the third Senate vote that Boeing had managed to conjure up, an article appeared in the San Francisco **Chronicle** (May 18, 1971) entitled "Radiation Warning on the SST." Professor Johnston of University of California, Berkeley declared that nitrogen oxides from SST emissions could have a devastating effect on the ozone layer. I called him up first thing that morning and he related a very interesting tale.

He was invited as an expert in gas phase reactions to an SST panel hearing conducted by the Commerce Department that March. He discovered that there was an error in the rate constant being presented for nitrogen oxides-ozone interactions. He called the speaker's and the committee's attention to this error. The speaker disagreed with him and the committee rejected Johnston's spur-of-the-moment, informal blackboard calculations. They required a formal report. Johnston returned to Berkeley and immediately fired off the "formal" report to the SST panel and also the President's Science Advisory Committee. He received no acknowledgement. On calling the Advisory Committee, he learned that his report had been sent out to consultants. Government contract consultants assess or evaluate such studies and render their opinion via formal report. And it takes time. Meanwhile the date for the Senate vote came closer. Sound familiar? See Early Lesson #3. Finally, one of the consultants, apparently realizing what was happening, leaked the report to the press just three days before the vote. The San Francisco **Chronicle** called Johnston to confirm and he gave them the full story.

The Senate voted for the 3rd time against funding the SST 58-37. In the final analysis it turned out to be essentially an economic decision. There was no way the SST could pay out. I have to believe that if it looked like it would make money we'd have them flying today.

**EARLY LESSON #4: Nobody gives squat about a science opinion — economics has it every time.** ■

---

1. T.A. Geissman, **The Chemistry of Flavanoid Compounds**, MacMillan, N.Y., 1962.

2. J.H. Adams, 'The Influence of Bulky Substituents on the Syntheses of 4-Hydroxy-3, 5-dialkyl flavanoids," **J. Org. Cehm.**, 32, 3992 (1967).

3. J.H. Adams, "Analysis of Nonvolatile Oxidation Products of Polypropylene III, Photodegradation," **J. Polymer Sci.** A-1, 8, 1279 (1970).

4. R.W. Singleton, R.K. Kunkel and B.S. Sprague, **Textile Res. J.** 35, 228 (1965).

5. R.D. Cadle and E.R. Allen, "Atmospheric Photochemistry," **Science**, 167, 243 (1970).

6. **Congressional Record**, March 23 and 24, 1971.

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## Gossip

*You avid gossip readers consumed with suspense by the ever-growing pregnancies of our business manager Andrea Sharp and typesetter Evelyn Eldridge-Diaz may now relax. Both gave birth in strictly the usual spectacular fashion (Andrea at home but she told no one she was going to so she wouldn't have to listen to boring sermons). They have diametric motherhood/career strategies. Evelyn is taking a many-month leave of absence to nurture Maria Francisca (called Pancha) properly, whereas Andrea was back at her desk practically before the placenta was delivered, the baby always with her. Popular kid. Whenever I can't find someone on the staff, they're either in the john or more likely in the back room holding Sarah.*

DON RYAN

**Andrea Sharp, Sarah Sharp, plugged into their various instruments.**

*Our other baby,* **The Next Whole Earth Catalog**, *is also doing fine. The fourth printing (all access updated) is almost done, 360,000 copies in print when it is. We got our first check from Random House — $117,000 — larger and earlier than expected. If the prosperity continues we will do a second edition, completely revised and updated, for next winter.*

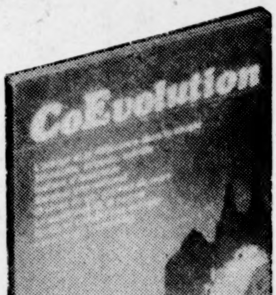
*Also in the works for next winter is a special issue of* **CQ** *on separatist politics, bioregionalism, and reinhabitation — a theme both activist and philosophical which is emerging on every continent and may direct history for decades to come. Editors for that issue are Peter Berg, editor of* **Planet Drum**, *and Stephanie Mills. They invite your submissions/suggestions on the subject.*

*Meanwhile the punk takeover of* **CQ** *continues. That spicy blond lady silhouetted against the sky scrubbing the windows and slinging hash in the kitchen is Debbie Hopkins, drummer for the all-female punk band The Contractions, recently back from a national tour. Annette LaBette continues to manage The Contractions. Tim Ennis is drumming for a band so new they don't have a name yet, but they're recording next week. And Jonathan Evelegh is now DJ for a San Francisco club called Le Disque; "I only get paid in alcohol."*

*The "B.S. Beaver" who did the drawings for pp. 94-101 was discovered making sandwiches at our local deli, Sausalito Cellars. We all got to appreciate her vicious wit amid deadly routine and so learned of her other talents. Shortly before illustrating "Secretary" she did temporary office work as a Kelly Girl and did not love it, no.*

*As economic pressure mounts to destroy the creative environment of the Sausalito waterfront, I've gleefully entered the fray after 20 years of successfully avoiding political activism. I sit on various boards, attend four or more meetings a week, co-write with cartoonist Phil Frank a column called "The Sausalito City Council Review Commission" for* **Marin Scope**, *and haven't enjoyed so many thrills and spills since I gave up hang gliding. Local politix is prime adrenal exercise.*

**CQ** *has spun out a new French magazine* **CoEvolution**, *a quarterly for 100 francs/year (foreign, 120 francs) from B.P. 43, 75661 Paris Cédex 14, France. The first issue was largely translations of old articles of ours, but the second issue is much more off in its own direction. Section*



*headings are suggestive: "The Love of Differences"; "The Part and the Whole"; "Symptoms of the Future"; "To Live with the Planet"; "Tools and Men"; "Apprenticeship"; and "Internal Space."*

*Soft Tech editor J. Baldwin continues to live and work with the New Alchemists in Cape Cod (revolutionary new wind machine brewing) and leavens his remote editorship with personal correspondence:*

*"Dear Steph. A rowdy bunch of crows wakes us up every morning at 6 a.m. Is this caws for alarm? Love J."*

*"Dear J. Folks around here think you're a raven maniac. Love, Steph."*

*—SB*

## CoEvolution Quarterly — Spring 1981 Financial Report

| EXPENSES | Aug, Sept, Oct | Nov, Dec, Jan |
|---|---|---|
| Salaries and fees | | |
| Office | $ 20,446.54 | $ 28,303.14 |
| Production | 3,891.78 | 10,386.86 |
| Editors | 9,205.16 | 12,065.20 |
| Contributors | 480.00 | 5,449.00 |
| Office rental, materials, etc. | 10,272.31 | 23,079.31 |
| Phone | 1,152.39 | 1,851.86 |
| Promotion | 6,454.01 | 7,353.12 |
| Printing | 16,553.19 | 35,499.40 |
| | (30,000 NWEC)* | (50,000 copies) |
| Subscription process and mail | 24,633.01 | 33,719.52 |
| Shipping | 323.47 | 1,325.33 |
| Business reply | 1,450.00 | 2,450.00 |
| Refunds | 400.00 | 750.00 |
| Total | $ 95,261.86 | $162,232.74 |
| **INCOME** | | |
| Subscriptions, gifts and renewals | $ 97,742.11 | $ 190,072.85 |
| Retaining and Sustaining | 2,530.00 | 2,290.00 |
| Back issues | 4,304.10 | 4,170.50 |
| Distribution | 8,568.93 | 11,413.49 |
| Total | $113,145.14 | $207,946.84 |
| **NET GAIN OR (LOSS)** | **$ 17,883.28** | **$ 45,714.10** |

*All catalog costs not yet included

## 'Or Whole Earth Household Store'

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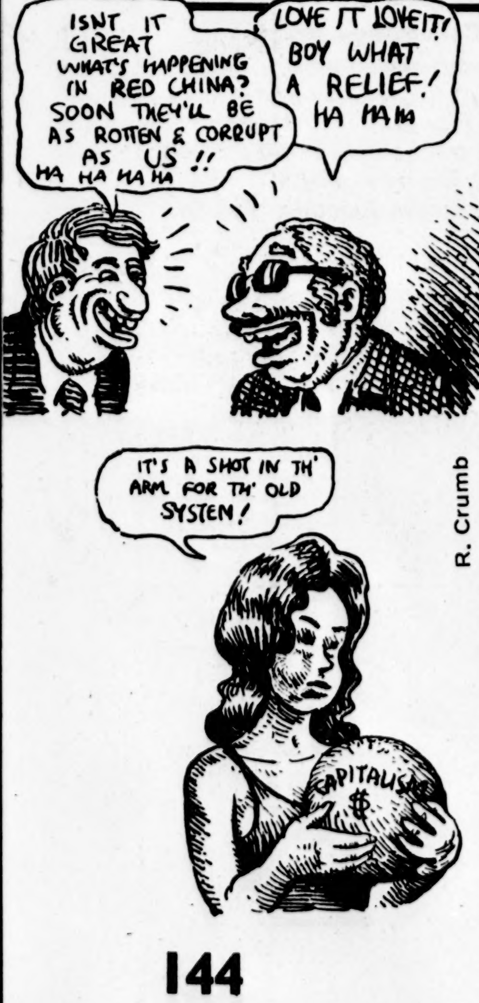
**Or visit** the new Household Store in San Francisco's Fort Mason Center, Building D, open from ten to four Tuesday through Saturday.

**Do not** send Household Store orders to **CoEvolution Quarterly.**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LOVE IT LOVE IT! BOY WHAT A RELIEF! HA HA HA
IT'S A SHOT IN TH' ARM FOR TH' OLD SYSTEM!
CAPITALISM
$

R. Crumb

## POINT Financial Report

| | Nov, Dec 1980 Jan 1981 |
|---|---|
| **CQ (detail above)** | |
| Income | $207,946.84 |
| Expense | 162,232.74 |
| **Next Whole Earth Catalog** | |
| Income | 15,912.50 |
| Expense | 17,336.41 |
| **Other products (posters, maps, T-shirts, etc.)** | |
| Income | 13,798.24 |
| Expense | 3,195.17 |
| **Miscellaneous** | |
| Income | 300.00 |
| Expense (includes loan repayments) | 40,841.02 |
| **TOTALS** | |
| INCOME | 237,957.58 |
| EXPENSE | 223,605.34 |
| **NET GAIN OR (LOSS)** | **$ 14,352.24** |

## POINT Balance Statement 31 January 1981

| | |
|---|---|
| ASSETS | |
| Cash in bank | $26,724.12 |
| Investments | 9,016.15 |
| Accounts Receivable Distributors | 35,717.70 |
| INVENTORY | |
| Back issues, CQ | 171,087.50 |
| Other products | 4,546.16 |
| NWEC (gross sales) | 838,747.78* |
| LIABILITIES | |
| Accounts payable, current | -0- |
| Accounts payable, long-term | 20,000.00 |
| Subscription liability | 372,252.00 |
| Cost of NWEC | 721,437.48* |

*These are estimates.

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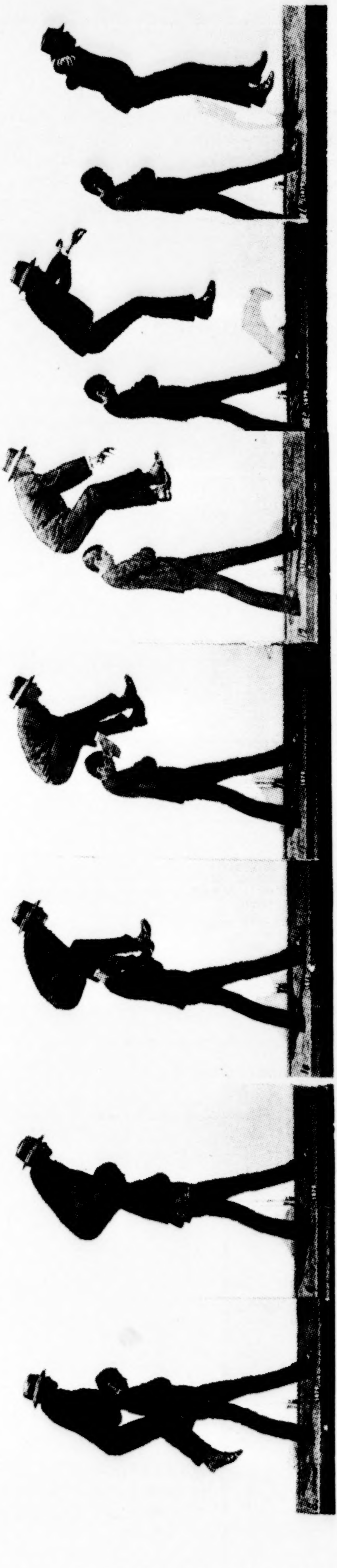
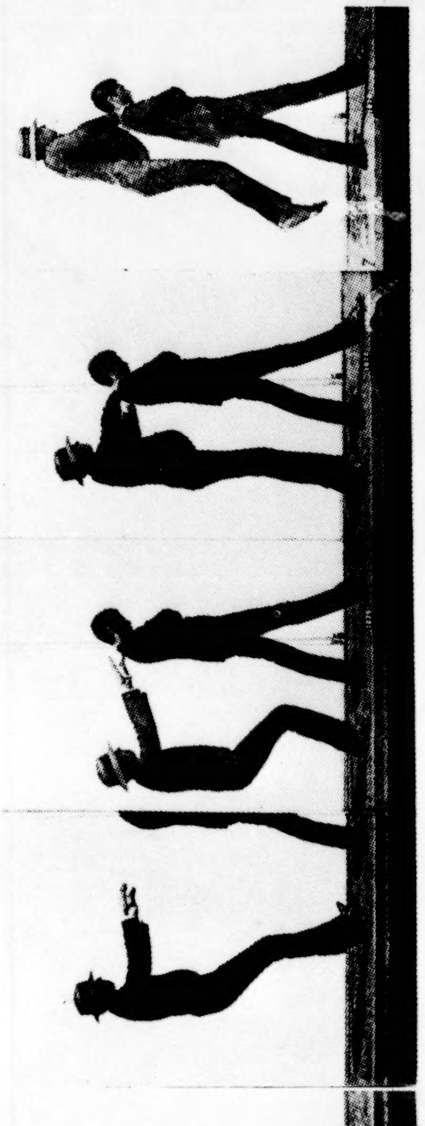


"Jumping over boy's back (leapfrog)" from Muybridge's Complete Human and Animal Locomotion*

---

*Edward Muggeridge was born in 1830 in Kingston-upon-Thames, England. In 1852, he moved to San Francisco and became Edward Muygridge, book dealer. In 1860, he was involved in an almost fatal stagecoach accident and by the time he had recovered, he was Eadweard Muybridge, photographer. He was famous for his views of Yosemite by 1874 when Leland Stanford, the railroad builder, asked him to take a series of photographs of his horse running to prove Stanford's theory that at one point in the gallop all four feet are off the ground. Muybridge said that it wasn't possible to take such photographs, and Stanford said, "I think if you will give your attention to the subject, you will be able to do it, and I want you to try."

*over*



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Muybridge tried and succeeded in taking some shadowy pictures that satisfied Stanford that he was right about horse feet and convinced Muybridge to spend the rest of his life trying to do better. He worked with Stanford for a while and later went back to England. He was about to be elected to the Royal Academy when Stanford ruined him by falsely claiming that Muybridge's most famous photographs were taken by another photographer. Muybridge ended up doing his major work, 781 plates of animal and human motion, for the University of Pennsylvania's Veterinary School. As Muybridge loved to point out, nobody really knew how people and other animals moved until he did his studies.

—Anne Herbert

Eadweard Muybridge's **Complete Human and Animal Locomotion**, 1887, 1979; 3 volumes, 3265 pp. is available for $100 postpaid from Dover Publications, 180 Varick Street, New York, NY 10014.

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☐ Air Mail, *for each year add:* Mexico & Central America $9; South America $14; Europe $14; all others $18.

**The Next Whole Earth Catalog, T-shirts, posters and postcards**

☐ **The Next Whole Earth Catalog** $14

**T-shirt** $6

☐ X-Small ☐ Small

☐ Medium ☐ Large

☐ X-Large

☐ **One Million Galaxies Poster** $5. *(Sent UPS in continental U.S. All others $7.50)*

☐ **Biogeographical Map** $3.50

☐ **Postcards** $3 for ten cards

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## CHANGE OF ADDRESS

**Old address** (Put your label here)

Name

Address

zip

**New address**

Name

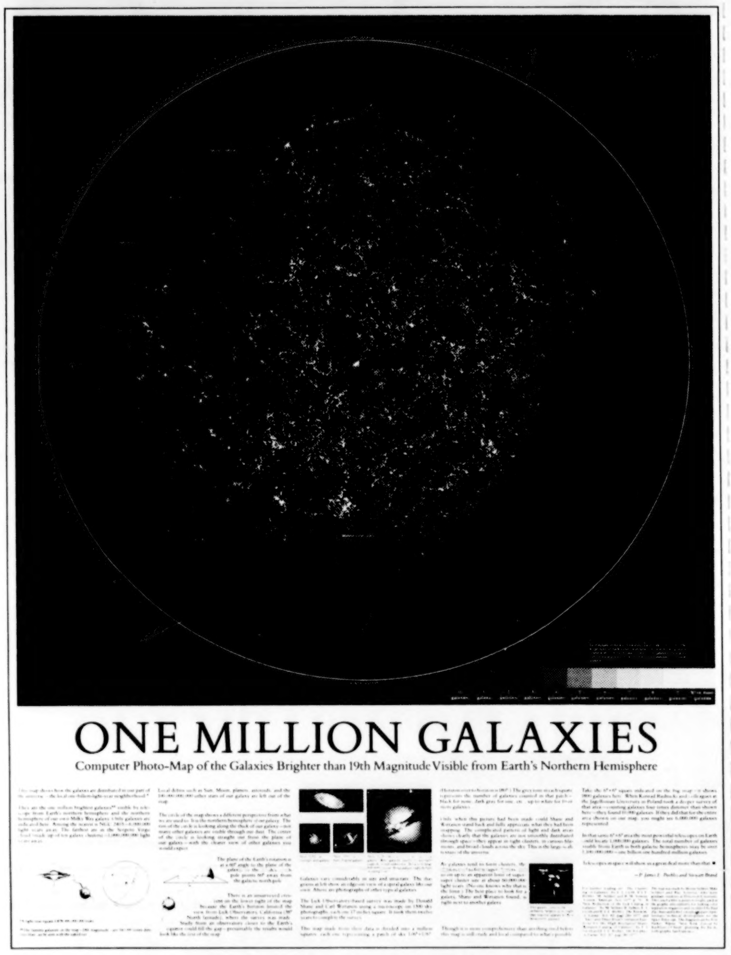
Address

zip

# FROM US

## CoEvolution T-shirt $6

White and light blue on dark blue 100% cotton, these shirts have a nice durability both of image and material. The first washing will shrink them a bit.


ONE MILLION GALAXIES
Computer Photo-Map of the Galaxies Brighter than 19th Magnitude Visible from Earth's Northern Hemisphere

## One Million Galaxies Map 39" x 47"

**$5 continental U.S. (All others $7.50)**

"On a square yard of glossy black this poster image, profound, enigmatic, beautiful, presents in a clotted tangle of tiny gray squares one abstract but faithful view of the entire thing . . . No Tantric demon or benign celestial choir provides a more vivid symbol of the vastness of the universe in which we live."

Philip Morrison
**Scientific American**

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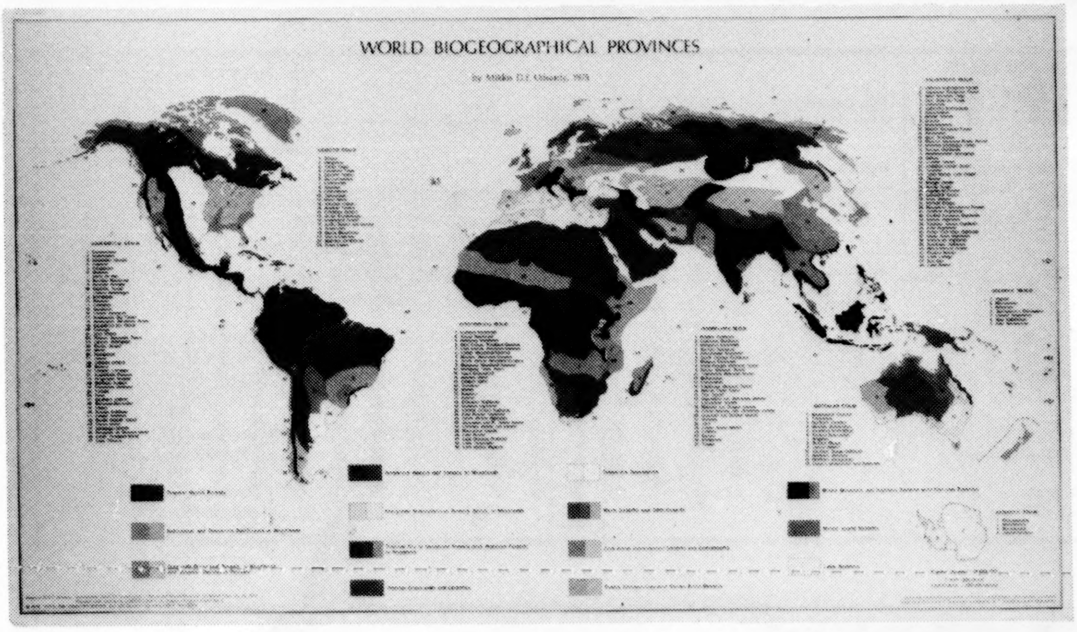
WORLD BIOGEOGRAPHICAL PROVINCES

## World Biogeographical Provinces Map $3.50

Charting biological politics which transcend nationality, Miklos Udvardy's map "can be a guide to locating the kind of country in which you feel at home," says Ray Dasmann, whose classic article "Biogeographical Provinces" accompanies the map. The first two printings of this 39" x 22" wall-full sold out; the third presented an opportunity for correction and refinement.

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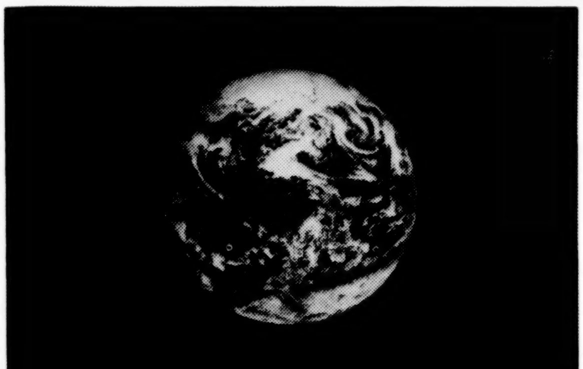
## Whole Earth Post Cards $3 for ten cards

Home sweet home sharply photographed from the reaches of space. 4" x 6" cards eminently suited for succinct correspondence. We use them ourselves.



## The Next Whole Earth Catalog $14

**". . . a perfectly splendid catalog and, yes, a useful tool . . . I found myself informed, entertained and enticed . . . Since the Catalog is imaginatively organized and illustrated and consists mostly of recommended books and tools, turning its pages is akin to browsing through a combined book and hardware store — in other words, great fun. Along with the fun, a reader cannot help being impressed by the abundance of solid fact, obviously the result of devoted effort by an energetic staff."**

Samuel C. Florman
**New York Times Book Review**

**"Quality again follows quantity; it is a prize . . . The 600 pages offer coherent reviews of good books old and new and keen judgments of specialized magazines, all of them shrewd guides to sources, both of knowledge in print and of the tools of almost all trades . . . A glow of goodwill, courage, reason and profound engagement suffuses this remarkable volume, a reference compendium for hardware and software, plumbing and philosophy, at once traditional and iconoclastic."**

Philip Morrison
**Scientific American**

THE NEXT Whole Earth Catalog
ACCESS TO TOOLS
EDITED BY STEWART BRAND

**The Next Whole Earth Catalog** (Access to Tools), edited by Stewart Brand. 1980; 608 pp. $14

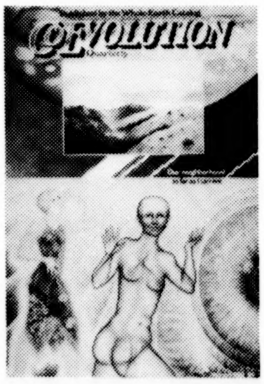
## CoEvolution Quarterly $14 per year

As it carries no advertising (except this right here), **CoEvolution** tries to take maximum advantage of that freedom. We are limited to no subject area and don't have that second-hand fear of readers that advertising encourages. So far as we know, **CQ** is the only general interest magazine in the world supported solely by its readership.

## Back Issues $3

Issues 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, and 28 are available. The regular current issue of the **CoEvolution Quarterly** is $4.

**No. 28, Winter 1980**
Guest edited by Anne Herbert, includes an account of the death of Gregory Bateson by his daughter Mary Catherine, an attack on the evils of circumcision, good news about neighborhood life from the editor and others, and Orville Schell on the dangers of feeding antibiotics to livestock.



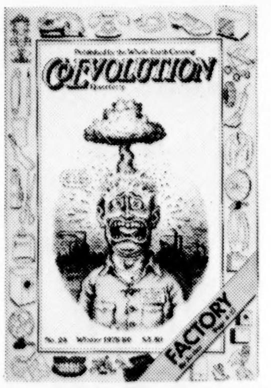
**No. 26, Summer 1980**
Native American running, an extensive article on amateur insemination by lesbians, Ivan Illich on vernacular values, Lynn Margulis on a new theory of how evolution happens, and "Some Peculiarities of the Cat, Harley."

CoEVOLUTION

**No. 25, Spring 1980**
Turning back the desert by planting trees, using light rail to revive public transportation, James Lovelock on being a self-employed scientist, "Our Enemies, Ourselves" (on Russia), and an article on Shramadana — sharing energy.

CoEVOLUTION

**No. 24, Winter 1979/80**
How corporate patenting of seeds will cause hundreds of plant species to be lost forever, good solar building designs used throughout history, Gregory Bateson on ending the arms race, and a major poem on the dehumanizing horror of factory work.



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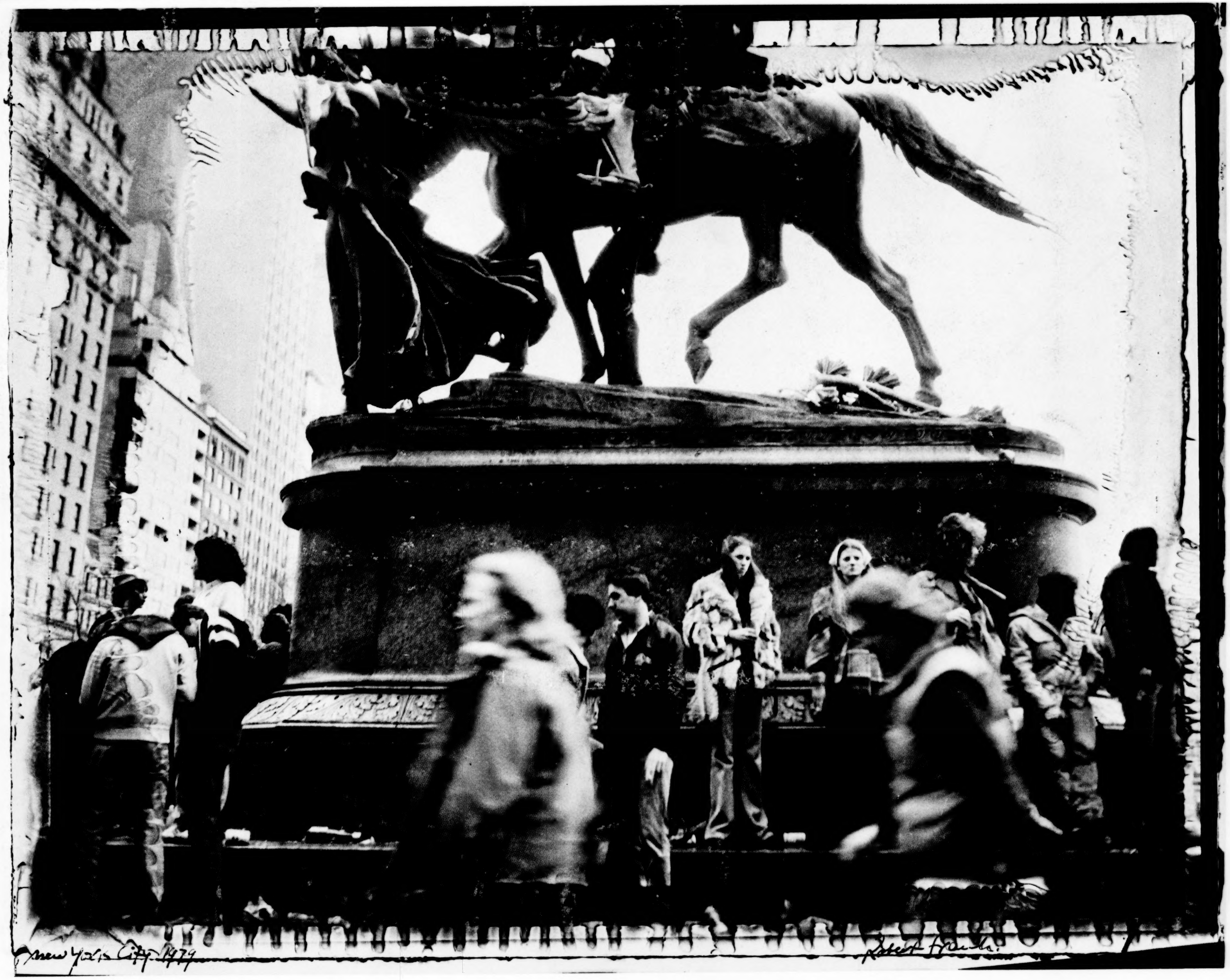

New York City 1979

Robert Frank